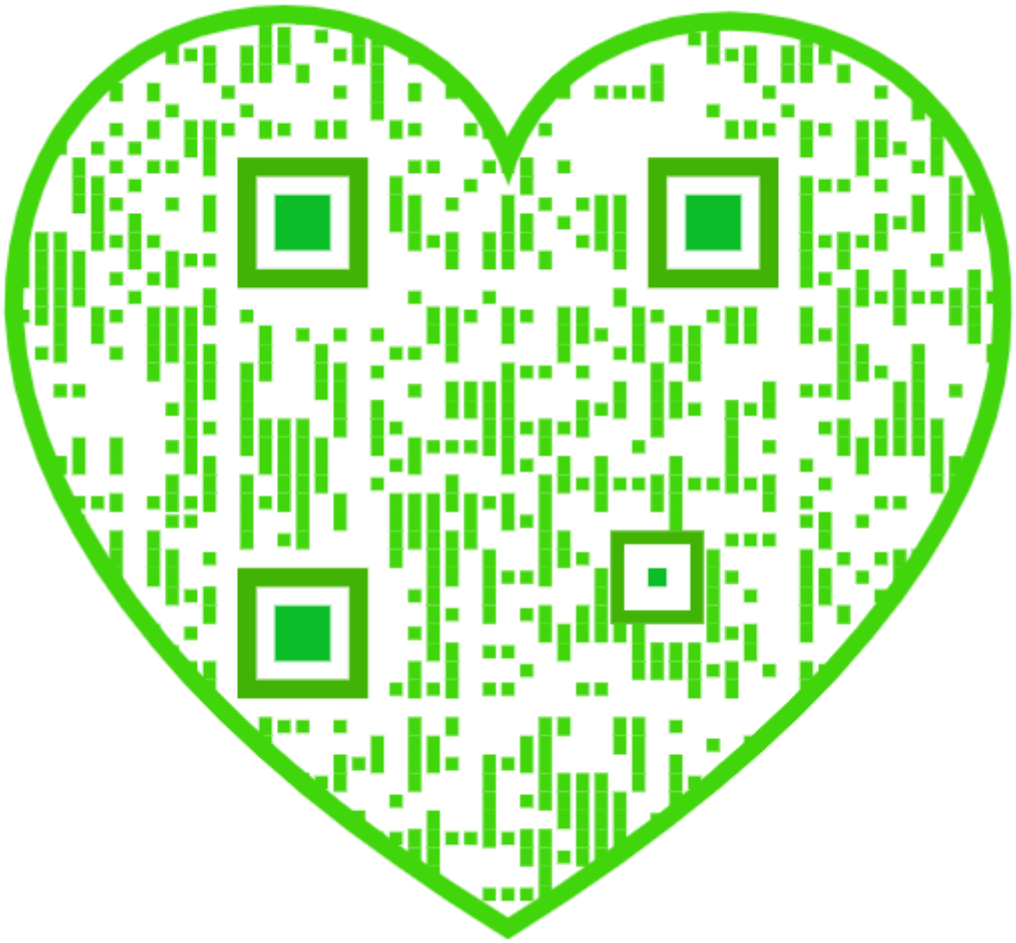

INDIAN BASKETRY

Plate 158. See page 346

COWLITZ (SALISHAN) PACKING BASKET AND KLITITAT (SHAHAPTIAN) BERRY BASKET

Both in imbricated decoration

Collected by Charles Wilkes and W. H. Holmes

Indian Basketry

Studies in a Textile Art Without Machinery

By Otis Tufton Mason

Curator, Division of Ethnology, U. S. National Museum

VOLUME II

NEW YORK
DOUBLEDAY, PAGE & COMPANY
1904

N.H. Tech. M 381 i

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PUBLISHED, OCTOBER, 1904

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INDIAN BASKETRY

INDIAN BASKETRY

CHAPTER VII

Ethnic Varieties of Basketry

For all arts belonging to humanity have a common bond and are included, as it were, in the same kinship.—Cicero.

The technical processes, the decorations, and the symbolism that may exist in the single basket having been scrutinised, it is in order to examine the geographic distribution of these forms in relation to ethnology and environment. Geography has much to do with human enterprises. It does not furnish the ingenious mind nor the skilful hand, but it does supply the materials for their exercise and set bounds in which the mind and hand soon discover how to reach their best.

America was, in aboriginal times, unequally occupied by native peoples. On the Atlantic slope in both continents vast areas were in possession of single linguistic groups, called families. On the Pacific slope there were also a few influential families, but the rule was otherwise. Wedged in among the mountains, wherever there was an inclosure abounding in food supply, there were crowded what seemed to be shrivelled remnants of once larger peoples, or fragments of disrupted families.

At once arises the query, Did they bring with them and preserve uncontaminated the stitches and patterns of their priscan basketry and keep the ancient models unchanged? It is to be feared that they did not, and that is why the ethnologist becomes embarrassed in trying to harmonise ethnology and technology. There are, notwithstanding, certain general effects which may be associated with definite peoples.

1. In the eastern region the prevailing families were Algonquian, Iroquoian, Muskhogean, Caddoan, and a few remnants of smaller ones, in some instances numbering at present less

than a hundred persons. The Siouan and other buffalo-hunting tribes on the plains will be slightly noticed because the hide of the slain animals furnished them with receptacles as well as other conveniences of life. The basketmakers in their territory belonged elsewhere.

2. In the Alaskan region an interesting state of affairs existed with reference to the matter here investigated. In the interior of the peninsula are the Athapascan (or Tinné) tribes. Around the coast-line dwell members of the Eskimauan family, having entirely different materials, workmanship, and technical processes. It will be seen later that the Eskimo as a whole are not skilful basketmakers. There has been contact, however, between the two linguistic families. The Aleutian peoples are very different in this art from the Eskimo, their ware being among the most highly admired on the continent. In southeastern Alaska the Koloschan family are found, who are different from the Athapascans in the interior of the peninsula in that they do not make coiled basketry at all. The same is true of the Haida or Skittagetan family, in the Queen Charlotte Islands.

3. In the Fraser-Columbia region, including the drainage of these great rivers, the Salishan family, the Wakashan, the Shahaptian, and the Chinookan are the present basket-making families. As in the Siouan country, so here, a few small fragments or survivals fill in the gaps and waste places, but they contribute little to the technical processes involved. In the discussion of basketry in this province a special characteristic will be brought out.

4. The California region, including also southern Oregon, is the most mixed of all in its ethnology. Many stocks of people whose languages are not known elsewhere, and many fragments of stocks that have a larger existence in other parts of America, are wedged into the mountain valleys and drainages of the streams. Nature has been most lavish here in her materials, and the finest textile plants for making baskets are

to be found in California. The diversity of technic is almost as great as that of language. Few styles of weaving or coiling exist that do not have their representatives among this interminable labyrinth of valleys.

5. The Desert, or Interior region, is occupied in its northern portion by the great Shoshonean family, which extends from the forty-ninth parallel to Costa Rica, pushes its way over the Rocky Mountains into the Mississippi drainage, and across southern California to the Santa Barbara Islands on the Pacific coast, giving and receiving technical suggestions on its way. In the southern portion of this interior region, Athapascan (both Navaho and Apache), Yuman, and Piman tribes are basketmakers.

6. The sixth region includes Middle and South America, not because all the basketry in these regions is on the same plane, but owing to the small collections received from these quarters. A great portion of it is in the torrid zone, where palm leaf and tough cane and reeds await the basketmaker. There will be missing characteristics of the North American tribes, and also local weaves will appear worthy of study.*

Unlike pottery, this fabric is not destroyed by frost, so that wherever textile material could be obtained there was no meteorological reason why the basket should not be forthcoming. The Athapascans of Alaska and northwestern Canada, possessed of both willow and spruceroot, at once developed the coiled ware which their kindred, the Apache, are still making in Arizona.

East of the Rocky Mountains, in the Atlantic drainage of Canada and the United States, at the present time checker

* The author acknowledges that many statements made in this ethnic portion of the work are at second hand and he has been fortunate in being able to consult men of expert information. The Hudson and the Merriam collection, in Washington City, the Benham, Tozier, Emmons, Teit, Long, Whitcomb, McLeod, and others of the west coast, have been placed cheerfully at his disposal. To Mr. C. C Willoughby, Dr. Boas, Mr. Pepper, Dr. Dorsey, Dr. Dixon, Dr. Kroeber, and others mentioned in these pages, he is indebted for constant favours. He hopes that errors will be condoned.

and willow work are practised almost universally; but in the mounds of the Ohio Valley quite well-diffused twined ware is found. The Gulf province afforded excellent cane (*Arundinaria macrosperma, Arundinaria gigantea, Arundinaria tecta*), and here, both in ancient times and in modern, diagonal plaiting of basketry and matting was prevalent in all tribes. The Plains region in its central portion relied chiefly on the hide of animals for its receptacles. But around its borders will be found intrusive processes of manufacture in twined, diagonal, and coiled workmanship.

On its Pacific slope North America is the home of basketry. From Attu, the most westernmost island of the Aleutian chain, to the borders of northern Mexico, is to be found practically every type of this art.

In Middle America, including southern Mexico and the Central American States, pottery was exalted among receptacles, and excellent fibers usurped the function of the coarser pliable materials of basketry.

Owing to differences of climate, rainfall, and other characteristics of environment, the materials for basketry vary greatly from region to region throughout America, and this in spite of all ethnic considerations. Again, the motives for the use of basketry differ from place to place, so much so that peoples of one blood make one ware in this place and another in that. Finally, however, it must never be forgotten that the ideas, utilitarian and artistic, in the minds of the manufacturers themselves, serve to bestow special marks upon the work of different tribes so as to give to them ethnic or national significance under any circumstances. In the following chapters the typical forms of the various families of Indians will be illustrated.

Were there no mixture of tribes, it might be possible to state in every case the maker of each specimen from the technic and the ornamentation, though this opinion must be held with reserve. Throughout the entire continent the practice of

capturing women was common; in each case the stolen ones carried to their homes the processes they had been familiar with in their native tribe. The Twana Indians on Puget Sound practice ten different methods of basket-making; the Pomo Indians have eight processes; the Hopi Indians of Arizona have at least five. It is well known that these tribes belong to synthetic families. In order to comprehend the extent of this relationship between the tribe and the art, the various basket-making groups will be defined and the types of their work illustrated. (See Plates 154, 155.)

The mixing of basketwork from the travelling about of women is well illustrated in the story of Maria Narcissa, told by E. L. McLeod, of Bakersfield, California. Maria was born at San Gabriel Mission and brought up in Tejon Canyon. There she retained the knowledge of her native speech and learned the dialects of the surrounding tribes. She married an American, reared and educated a large family of children, and is still living. On her testimony, tribes from the north as far up as Tule River would come down to Tejon for social and religious purposes, hold great feasts and dances, and gamble on the gaming plaques. Parties came longer journeys from San Fernando, San Gabriel, Ventura, Santa Barbara, and Santa Ynez, and Mr. McLeod finds undoubted evidences of these meetings in the technic and the decorations on basketry. (See Plates 115–116.)

From the Tule River country there came the beautiful flexible work, an improvement on the Fresno ware. But the Tejon basketry excelled, the pieces were better finished, there was more emulation, a greater variety of patterns, showing the influence of both north and south.

There was trading of materials likewise, for you will see fine old pieces from the caves on the Tejon with mission bottoms and Tejon tops, also old specimens from caves in Santa Barbara County which were made in Tejon. The student of basketry suffers another embarrassment in common with the

naturalist, namely, the fact that the place of procuring a specimen is not the same as that of its origin. Finally, a basket may have two or more names that are really synonyms, as Tulare, Yokut, and Mariposan, and, finally, while in a collection like that of Doctor Merriam the student cannot go astray for his tribe, in the myriads of desultory gatherings the owners themselves are never sure of the source.

List of Basket-Making Tribes

The following list includes the names of those tribes known to collectors as makers of any kind of basketry, especially in North America, together with the linguistic families to which they belong, and their locations.

Abenaki, Algonquian family, Maine and Canada.
Aleut, Eskimauan family, Aleutian Islands.
Algonquian family, northern frontier and Canada, many tribes.
Apache, Athapascan family, See Chiricahua, Jicarilla, Mescalero, San Carlos, White Mountain, in Arizona, New Mexico, and Oklahoma.
Apache-Yuma, Yuman family, Palomas, Yuman County, Arizona.
Arapaho, Algonquian family, Shoshoni Agency, Wyoming; and Oklahoma.
Arikara, Caddoan family, Fort Berthold, North Dakota.
Ashochimi, Yukian family, near Healdsburg, California.
Atsuge. See Hat Creek, branch of Pit Rivers.
Attakapa, Attakapan family, southern Louisiana.
Attu Island. See Aleut.
Auk, Koluschan family, Gastineaux Channel, southeastern Alaska.
Basket Makers, Ancient Shoshonean family, Grand Gulch, southeastern Utah.
Bella Coola. See Bilhula. Bella Bella.
Bilhula, Salishan family, northwestern British Columbia.
Cahuilla. See Coahuilla.
Calapooia, or Kalapuya.
Calpella, Kulanapan family, Ukiah, California.
Carriers. See Thompson Indians.

Cayuse, Waiilatpuan family, Umatilla Agency, Oregon.
Chaves Pass Ruin, Hopi pueblo, Arizona.
Chehalis, Salishan family, Chehalis River, Washington.
Chemehuevi, Shoshonean family, southern Arizona and California boundary.
Cherokee, Iroquoian family, North Carolina and Indian Territory
Chetimachas, Chetimachan family, Louisiana. Also written Shetimachas.
Chevlon Ruins, Hopi pueblo, northeastern Arizona.
Chickasaw, Muskhogean family, Indian Territory.
Chilcotin, Athapascan family, Tsilkotinneh or Chilkyotins, distinct from Carriers, British Columbia.
Chilkat, Koluschan family, southeastern Alaska.
Chinook, Chinookan family, southeastern lower Columbia River, Washington.
Chippewa, Algonquian family, northern United States.
Chiricahua Apache, Athapascan family, Arizona and Oklahoma.
Choctaw, Muskhogean family, Louisiana.
Chukchansi, Yokut tribe, Mariposan family, Sierra region, California, between Fresno Creek and San Joaquin River.
Clallam, Salishan family, Washington.
Clatsop, Chinookan family, Clatsop County, Oregon.
Coahuilla, Shoshonean family, Coahuilla, Kawia, Kauvuya, Agua Caliente, Santa Rosa, Cabezon, Torres, Twenty-nine Palms, and Cahuilla reservations, California; also Saboba, southern California.
Cocahebas, Shoshonean family, Burr Valley, California.
Coconinos. See Havasupai, Yuman family.
Cocopa, Yuman family, near Mexican boundary, Arizona, and Lower California.
Comanche, Shoshonean family, Indian Territory.
Concow, Pujunan family, Round Valley, California.
Coos, Kusan family, Coos County, Oregon.
Coquille, Kusan family, Coos County, Oregon.
Couteau. See Thompson Indians.
Cowlitz, Salishan family, Cowlitz River, Washington.
Coyotero Apache, Athapascan family, southern Arizona.
Coyuwee. See Paiutes.
Creeks, Muskhogean family, Southern States and Indian Territory.
Dieguefios, Yuman family, San Diego County, California.

Capitan Grande, Sequan, Santa Ysabel, Campo, Cuyamaka, and Morongo reservations.

Diggers, Pujunan family (a popular name applied to vegetarian tribes), California, east of the Sacramento. See Maidu.

Eel Rivers, Athapascan family. See Flonko.

Eskimo. Eskimauan family, Arctic America.

Flathead, Salishan family, misnomer for Salish.

Flonko or Lolonkuh, Athapascan family, Eel River, California.

Fraser River, Salishan family, British Columbia.

Galice Creek, Athapascan family. Siletz reservation, Oregon.

Gallinomero, Kulanapan family, Cloverdale, California.

Garotero, Athapascan family. (Same as Coyotero.)

Gualala, Kulanapan family, Mendocino County, California.

Haeltzuk, Wakashan family, British Columbia.

Haida, Skittagetan family, Southern Alaska, Dall, Prince of Wales Islands, Queen Charlotte Islands, and British Columbia.

Hat Creek, Palaihnihan family, northeastern California, branch of Pit Rivers.

Havasupai, Yuman family, Cataract Canyon, Arizona.

Hoh, Chimakuan family, Neah Bay, Washington.

Homolobi, ancient ruin near Winslow, in Arizona.

Hoochnom, Yukian family, Round Valley, California, Eel River.

Hoonah, Koluschan family, Cross Sound, Alaska.

Hootz ah tar, Kaluschan family, Alaska.

Hopi, Shoshonean or Hopian family, Pueblos, northeastern Arizona. Wrongly Moki.

Hualapai. See Walapai.

Huicholes, Piman family, Zacatecas, etc., Mexico.

Hupa, Athapascan family, Trinity River, California.

Iroquois, Iroquoian family, northern frontier and Canada.

Jicarilla Apache, Athapascan family, northern New Mexico, Jicarilla Agency.

Kabinapo Pomo, Kulanapan family, Clear Lake, California, western part.

Karok, or Cahroc, Quoratean family, Klamath River, California, Lower Salmon River, and down Klamath to a few miles above Waitspeh.

Kaweah, Mariposan family, middle California, not Coahuilla.

Klamath, Lutuamian family, Klamath County, Oregon.

Klikitat, Shahaptian family, Yakima Reservation, Washington, Klikitat County, Oregon.

Kohonino, Yuman family, near the Havasupai.
Kwakiutl, Wakashan family, British Columbia.
Lillooet, Salishan family, western British Columbia.
Little Lakes, Kulanapan family, Round Valley Reservation, California.
Lolonkuh, Athapascan family, Eel River, California.
Luiseño or San Luis Rey Mission, Shoshonean family, Mesa Grande, Potrero, Temecula, Rincon, Los Coyotes, Pauma, and Pala reservations, villages at San Luis Rey, and San Felipe, California.
Lummi, Salishan family, north Puget Sound, Washington.
McCloud or Winnemem, Copehan family, northern California.
Maidu, Pujunan family, east of Sacramento River, California, Sacramento to Honey Lake, from Big Chico Creek to Bear River, California.
Makah, Wakashan family, Cape Flattery, Washington.
Makhelchel, Copehan family, Clear Lake, California.
Mandans, Siouan family, North Dakota.
Maricopa, Yuman family, southern Arizona.
Massawomekes, Iroquoian family, on northern Chesapeake.
Mattoal, Athapascan family, northwestern California.
Mayas, Mayan family, Yucatan and lands adjacent.
Melicite, Algonquian family, Quebec and New Brunswick.
Menomini, Algonquian family, northeast Wisconsin.
Mescalero Apache, Athapascan family, Mescalero Agency, eastern New Mexico.
Mew-as or Mu-was. See Miwok.
Micmac, Algonquian family, Nova Scotia, New Brunswick, and Quebec.
Missions, a great many villages, Shoshonean and Yuman families, southern California.
    Agua Caliente (Shoshonean), a rancheria in western San Diego County.
    Augustine (Shoshonean).
    Coahuilla, Kawia (Shoshonean).
    Comoyei, Yuman family, all Yuma dialects between Lower Colorado River and Pacific Ocean and 32° to 34° north, Comoya, Quemaya, called Diegueños on the coast.
    Cuchan, Yuman family, Yumas so called.
    Cupania, in Agua Caliente.
    Diegueño, Yuman family, in Capitan Grande, Campo,

Missions—(Continued.)
Cuyamaka, Inaja, Sequan, Santa Ysabel, Mesa Grande, San Felipe, Manzanita villages.
Kawia, Shoshonean family. See Coahuilla.
Matayhoa, possibly the Diegueño village of Mataguay, in western part of San Diego County.
Piute, Shoshonean family, at Twenty-nine Palms.
Playanos, Shoshonean family, coast tribes of Coahuilla.
Saboba (School), Shoshonean family, Tahktam village, San Jacinto Valley.
San Felipe, Yuman family, a Diegueño rancheria of this name was seventy miles northeast of San Diego in 1883.
San Fernando, Shoshonean family, related to San Gabriel.
San Gabriel, Shoshonean family, also Kizh dialect, Tobikhar of Loew.
San Juan Capistrano, Shoshonean family, formerly Netela dialect, Gaitchim of Loew, called Juaneños.
San Lucania, Shoshonean family, also Cabezon, Potrero, Pala, Pauma, Rincon, Temecula, Puerto de la Cruz, Puerta Ygnacia, Torris, and Matajaui.
San Luis Rey (de Francis), Shoshonean family, formerly Kizh dialect.
Santa Inez. Same character of baskets as Santa Barbara.
Santa Rosa.
Serraño, Shoshonean family, Morongo, San Manuel, the Serraños or "mountaineers," formerly Tahktam, a division of Tabikhar.
Takhtam (men), Shoshonean family, called Serraños, dialect, Coahuilla.
Tule River, remnant of Tejon.
Yuma, Yuman family, evidently the Cuchan or present Yumas.
Miwok, Moquelumnan family, California, from the Sierra to the San Joaquin River, from Cosumne to the Fresno.
Modoc, Lutuamian family, Klamath Agency, Oregon, east of Shasta, north to Goose Lake Valley.
Mohave, Yuman family, between Fort Mohave and Ehrenberg, Lower Colorado River.
Moki or Hopi pueblos, Shoshonean family, northeastern Arizona.
Monos, Shoshonean family, sierras east of Yosemite, California.

Muckleshoot, Salishan family, Puget Sound, Tulalip Agency, Washington.

Nakum, Pujunan family. See Maidu.

Napa or Suisun or Solano, Copehan family, Sacramento River, California.

Natano, band of Hupa.

Navaho, Athapascan family, southern Utah, New Mexico, and Arizona.

Navarros, Kalanapan, Punta Arenas, California.

Nehalem, Salishan, Oregon.

Newooah (Nu-úah), Shoshonean family, Paiute Mountain, California.

Nez Percé, Shahaptian family, Nez Percé Agency, northern Idaho.

Nims, Shoshonean family, N. fork, San Joaquin River, California.

Nishinam, Pujunan family, Sacramento Valley, California.

Niskwalli, Salishan family, or Nisqualli, Columbia River, Washington.

Nomelaki or Numlaki, Copehan family, Round Valley, California.

Nozis, Yanan family, south of Pit Rivers, California.

Nutka, Wakashan family, West Vancouver Island. See Makah.

Ojibwa, Algonquian family, Michigan.

Opata, Sierra Madre, Sonora and Chihuahua.

Oraibi, Shoshonean family, a Hopi pueblo. (See Hopi).

Paiutes, Shoshonean family, Nevada agencies, Reno, Carson, and Wadsworth on central route of the Southern Pacific Company; Tule River Reservation, Kern River, White River, Poso Creek, Sierras near Walker Pass, eastern Nevada, Pyramid Lake, Schurz, Hawthorne, Virginia City.

Pakanepul, Shoshonean family, South Fork of Kern River, California.

Panamint, Shoshonean family, Death Valley, Inyo County, California.

Papago, Piman family, south of Tucson, Arizona, and Sonora, Mexico.

Patawat, Wishoskan family, Humboldt Bay to Arcata, California.

Patwin, Copehan family, Sacramento River, California.

Pawnee, Caddoan family. See Arikara.

Penobscot, Algonquian family, Old Town, Maine.
Peruvian, Kechuan family, Highlands of Peru.
Pima, Piman family, Gila River, Arizona.
Pit Rivers, Palaihnihan family, Pit River, California.
Pomo, many subdivisions, Kulanapan family, Mendocino and Lake counties, California.
Potter Valley, Kulanapan family, Round Valley, California.
Pueblos: of the Rio Grande, Tanoan, and Keresan families; those of the Zuñian family are in New Mexico; Shoshonean pueblos are in northeastern Arizona.
Puyallup, Salishan family, Puget Sound, Washington.
Queets, Chimakuan family, northwest Washington.
Quileute, Chimakuan family, northwest Washington.
Quinaielt, same as Quinaults, Salishan family, west Washington.
Redwoods, Yukian family, Round Valley Reservation, California.
Rees, or Arikara, Caddoan family, North Dakota.
Rogue Rivers, Athapascan family, Grande Ronde Reservation, Oregon.
Round Valley tribes. See Concow, Little Lakes, Nomelaki, Pit Rivers, Redwoods, Wailaki, and Yuki.
Saboba Mission, Shoshonean, southern California.
Salishan family, great variety of technic and many tribes, Washington and British Columbia.
San Carlos, Apache, Athapascan family, southeastern Arizona.
San Felipe pueblo, Keresan family, Rio Grande River, New Mexico.
Santa Barbara Mission, Moquelumnan family, southwestern California.
Santa Rosa Mission, Yuman family, San Diego County, California.
Santa Ysabel, Yuman family, San Diego County, California.
Seminole, Muskhogean family, Florida.
Shasta, Sastean family, in Shasta and Scott Valley, California.
Shoshoni, Shoshonean family, Great Interior Basin, Montana.
Shushwap, Salishan family, British Columbia.
Sia, Keresan family, New Mexico, a Rio Grande pueblo.
Sikyatki, ruin, ancient Hopi pueblo, northern Arizona.
Siletz, Athapascan family, Siletz Reservation, Oregon.
Sitka, Kaluschan family, Alaska.

Siwash, Chinook jargon for "Savage," general name for Northwest Coast Indians.
Skagit, Salishan family, North Puget Sound.
Skokomish, Salishan family, or Twana, upper Puget Sound, Puyallup Agency, Skokomish Reservation, Skokomish River, Washington.
Snohomish, Salishan family, upper Puget Sound, Tulalip Agency and reservation, northeast of the Skokomish.
Solano. See Napa.
Spokan, Salishan family, Montana and Washington.
Squaxin, Salishan family, Puget Sound.
Suisun. See Napa.
Tahchee, tribe of Yokuts on Tulare Lake.
Tarahumara, Piman family, Sierras of Chihuahua, Mexico.
Tarku, Koluschan family, Tarku Inlet, Alaska.
Tatu, Yukian family, Round Valley, United States Indian Agency, California.
Tejon, Tulares of Tejon Pass, Moquelumnan family.
Thompson Indians, Salishan family, also Couteau or Knife Indians, southern interior of British Columbia, mostly east of Coast Range, in valleys of Fraser, Thompson, and Nicola rivers.
Tillamuk, Salishan family, Tillamook County, Oregon.
Tinné, Athapascan family, name for tribes in Alaska and Canada.
Tlinkit, Koluschan family, southern Alaska.
Tolowa, Athapascan family, Crescent City, California.
Tonto Apache, Athapascan family, southern Arizona.
Towanhoo. See Twana.
Tsinuk or Chinook, Chinookan family, Columbia River, Washington.
Tulalip, Salishan family, Tulalip Reservation, Washington.
Tulares, Moquelumnan family, Tule River, California.
Tule Rivers, Mariposan family, southern California.
Twana, Salishan family, Puget Sound, Washington.
Ukie. See Yuki.
Umatilla, Shahaptian family, Umatilla and Morrow counties, Oregon.
Umpqua, Athapascan, Grande Ronde, Oregon.
Ute, Shoshonean, in Utah under many names.
Viard or Weeyot, Wishoskan family, Eel River, California.

Waiam, Shahaptian family, village rather than tribe, Des Chutes Rivers, Oregon.
Wailaki, Copehan family, Sacramento Valley, California.
Walapai or Hualapai, Yuman family, northwestern Arizona.
WallaWalla, Shahaptian family, Umatilla Agency, Oregon.
Wappo, Yukian family, Alexander Valley, California.
Warm Spring Apaches, Athapascan, Chiricahua, Mexico.
Wasco, Chinookan family, The Dalles, Oregon.
Washo, Washoan family, Reno, Carson, and Wadsworth, on central route of the Southern Pacific Company, western Nevada, Genoa, Gardenville Washoe, Franktown.
White Mountain Apache, Fort Apache Agency, eastern Arizona.
Wikchumni, Yokut tribe, Mariposan family, Kaweah River, California.
Wintun, Copehan family, Sacramento River, California.
Wuksatches, Shoshonean family, north of Kaweah River, California.
Wushqum, Chinookan, Columbia River, Oregon.
Yakima, Shahaptian family, Washington.
Yakutat, Koluschan family, Yakutat Bay, southeast Alaska.
Yamhill, Kalapooian family, Willamette Valley, Oregon.
Yana or Nozi, Yanan family, near Redding, California.
Yaqui, Piman, Sonora, Mexico.
Yoalmani, Yokut tribe, Mariposan family, Tule River Reservation, California.
Yoerkali, Yokut tribe, Mariposan family, Tule River Reservation, California.
Yokaia, Kulanapan family, Ukiah Valley, California.
Yokuts, Mariposan family, mid-California.
Yuki or Ukie, Yukian family, Round Valley, California.
Yurok, Weitspekan family, Klamath River, California.
Zuñi, Zuñian family, western New Mexico.

EASTERN NORTH AMERICA

For thus the tale was told
By a Penobscot woman
As she sat weaving a basket,
A basket or *abasnoda*
Of that sweet-scented grass
Which Indians dearly love.
—CHARLES GODFREY LELAND.

EASTERN North America will include the tribes east of the Rocky Mountains. Many of them are now basketmakers, but archeology is doing excellent service in helping to complete a map of this area in order to determine the distribution of the various technical processes that obtained in aboriginal times. The few types of the art that now survive must not be taken as covering the ground of ancient weaves. The recovery of the latter by the Bureau of American Ethnology, the Peabody Museum, and other explorations, is one of the most wonderful contributions of the spade to the ethnologist. Though basketry was anciently made of grass, hemp fiber, bark, young stalks, and sapwood, and for that reason is the most perishable of human manufactures, under favourable conditions salt mines, nitrous caves, the desert's aridity, metallic earths, and even fire have kindly preserved enough of the delicate textures to reveal the processes of weaving in vogue many centuries ago.

Indian women in the Mississippi Valley used to decorate the outsides of clay vessels by pressing string and basketry products on the soft material before burning. Thus they preserved the record of the art for all time. By applying modeller's clay to these ancient fragments the texture is at once revealed. In *Popular Science Monthly** will be seen account of experiments with these sibylline shards, by George E. Sellers. William H. Holmes simultaneously made larger investigations and published accounts of experiments by him on Mound Builders, and other ancient pottery of this area.† He carefully washed the fragments of their ware and

* Vol. XI, 1877, p. 573.

† Third Annual Report of the Bureau of Ethnology, 1884, pp. 393–425.

made casts of the outer surface. The result was astonishing. Natural forces had eaten away and greatly obscured the marks of textiles on the outside surface of the shards, but in the bottom of the cavities, filled for centuries with earth, the impressions have been carefully preserved, and "the manner in which the fabric in all its details of plaiting, netting, and weaving was constructed can be brought out quite as graphically as though one were examining the surface of the original vessels." On the surfaces of rocks the paleobotanist discovers the delicate impressions of leaves. In these indellible lines he reads the names of species of trees that grew millenniums ago. So, through these impressions on potsherds, the archeologist is able to discover lost arts of whose existence all other evidence has perished. (See Plate 107.)

All along our northern frontier and in many parts of Canada the Iroquois and Chippewa now fabricate baskets from the ash, birch, linden, and other white woods and the vernal or sweet grass (*Savastana odorata*). The method of manufacture is invariably the same; it is the plainest in-and-out checker and wicker weaving. (See Plates 119 to 121.) The basketry is far from monotonous, however, for the greatest variety is secured by difference of form, of colour, of the relative size of the parts, and of ornamentation. In form the baskets run the whole gamut, as among the Haida and Makah, guided by the maker's fancy and the demands of trade. These Indians all live on the border of civilisation and derive a large revenue from the sale of their wares. The colours are of native manufacture—red, yellow, blue, and green, alternating with the natural shades of the wood. To begin with the rudest, let us take a dozen or sixteen strips of paper half an inch wide and cross them so as to have one half perpendicular to the other half, woven in checker at the center, and extending to form the equal arms of a cross. Bend up these arms perpendicular with the woven checker and pass a continuous splint similar to the framework round and round in a continuous coil from

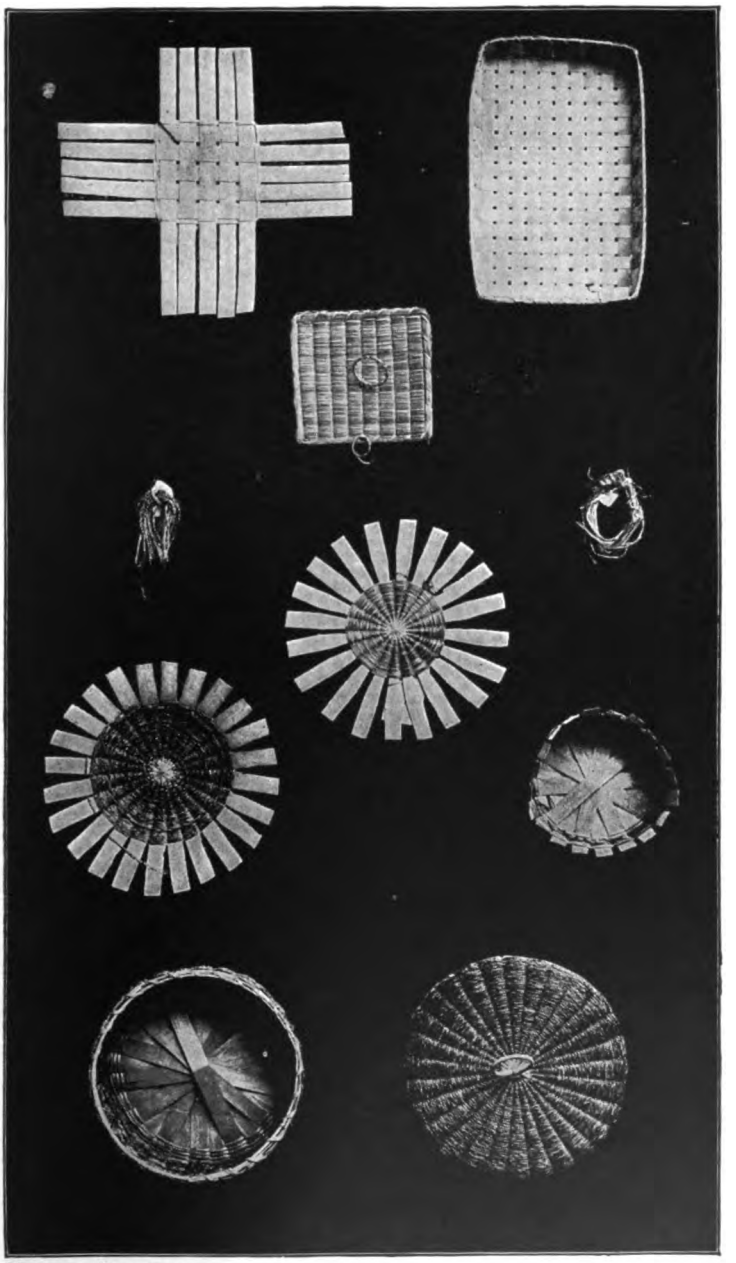


Plate 119. See page 270

ALGONKIN CHECKER AND WICKER BASKETRY, EASTERN CANADA AND UNITED STATES

Collections of U. S. National Museum

Plate 120. See page 271

CAROLINE MASTA, AN ABÉNAKI WOMAN, OF PIERREVILLE, CANADA, MAKING CHECKERWORK BASKETS

Photographed by Herbert B. Rowland

bottom to the top. Fit a hoop of wood to the top, bend down the upright splints over this, and sew the whole together with a whipping of splint, and you will have the type basket. (See figs. 9 and 10 on Plate 119.) Now, by varying the width of the splint used to cover the sides, a great difference of appearance is secured. The complete operation among the Menomini was studied out by W. J. Hoffman,* and will be seen in figs. 110 to 114. In the National Museum are baskets made of uniformly cut splints not over one-sixteenth of an inch in width.

Finally, the Algonkin, as well as the Southern Indians, have learned to decorate baskets with a great variety of rolls, looking much like the napkins on the table of a hotel. The weaver

FIG. 110.
ASH LOG FOR MAKING SPLINTS.
Menomini Indians.
After W. J. Hoffman.

draws a splint under the warp stick, gives it a turn up and down, or two turns in different directions, and draws the loose end tightly under the next warp stick but one. This operation is repeated, forming around the basket one or more rows of projecting ornaments. Morgan bears testimony to the skill of the Iroquois women in the art.†

The basket woman at her work sits upon the ground in front of her lodge, or frequently before a little booth or shelter—the first step in the evolution of the artist's studio. The materials which she gathered long ago with much pains, and has been hoarding up, are within easy reach. Her hands and her teeth are both available in her work, aided by only a small supply of tools. A number of Indian women at work will be seen in different connections throughout this paper.

* Fourteenth Annual Report of the Bureau of Ethnology, 1896, p. 260.
† The League of the Iroquois, 1851, pp. vi–55.

Plate 120 shows Caroline Masta, an Abenaki Indian woman from Pierreville, Canada, seated in her humble laboratory at Belmar, New Jersey. Her materials are of black ash (*Fraxinus nigra*) and sweet grass (*Savastana odorata*). The former has been worked out by machinery in Canada, and is piled up around her; the latter is gathered and braided by her relatives, and sent to her all ready for the last step in manufacture. This Indian woman conducts a thriving business, not being able to make up ware as fast as there is demand for it. Specimens of her work are shown in Plate 119, photographed by Herbert B. Rowland.

FIG. 111. WOODEN MALLET FOR LOOSENING SPLINTS.

To illustrate more fully the survival of the old art in the new era, Plate 121 represents three Chippewa women near Saginaw, Michigan, making splint baskets. They are seated no longer in the midst of wretchedness, but in an apple orchard. The clothesline and the receptacles filled with fruit mark the changed life. It will be noticed, also, that the woman on the left is using for her splints a gauge set with metal blades. Indeed, the broad strips lying on the ground were worked out by machinery. Checkerwork and wickerwork are the only forms of technic practised by these Chippewas. It will not be assumed by any one that the improvement in environment has redounded to the benefit of the savage art. The baskets are the common frame ware, and often the best of them bear no comparison in refinement with the work of their most savage sisters on the West coast. Photographed by Harlan I. Smith.

FIG. 112. BASKETMAKER'S KNIFE OF NATIVE WORKMANSHIP.

The acme of northern Algonkin weaving is in twilled

Plate 121. See page 272

CHIPPEWA WOMEN, NEAR SAGINAW, MICHIGAN, MAKING CHECKER AND WICKER BASKETS

Photographed by Harlan I. Smith

matting. The operation, technically, is just on the border between free-hand plaiting and loomwork. Plate 122 is a mat plaited by a Chippewa squaw, about fifty years old, at Grand Marais, Minnesota. It is of cedar bast made in strips a quarter of an inch wide, and is in three colours—one the natural tinge of the material and the other two dyed. The interesting features are, first, that the weaving is done from below upward, as in the Haida basketry, and in the work carried on by Virginia Indians in the days of John Smith.

A small rod or stiff cord of bark is suspended by means of eight loops from a pole resting on two forked sticks. This is to give free motion to the woman's hands. Over this the warp strings are suspended freely. The Chilkat blanket weaver, also, as will be seen, has no other machinery. For a few rows

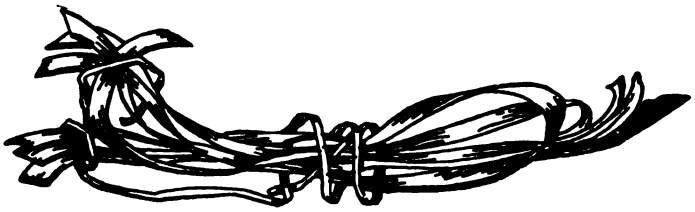


FIG. 113.
COIL OF BASKET STRIPS.

the weaving is simple checkerwork of the plainest kind, and then begins a series of twilled patterns over two and under two. But even this simplest technic so lends itself to charming effects of light and shade that there is not a monotonous square inch on the surface. Another band of plain weaving is followed by zizgag and angular work, inclosing lines and squares, giving birth to a very pleasing effect. Some of the oldest pictures preserved in the early chronicles of the Algonkin Indians, to whom the Chippewa belong, show them weaving in exactly the same fashion.

The mat described above was made for Captain R. D. Gaillard, U. S. A., in a single day, the work beginning at nine o'clock in the morning and the finished product being delivered

two miles away at four o'clock in the afternoon. It is six feet five inches long and four feet five inches wide.

The Menomini Indians of the Algonquian family, living in northern Wisconsin, are quite expert in various forms of basketwork and hand-weaving. Mats are woven from the leaves of rushes, flags or cattails, and cedar bark. They are for roofing temporary structures, such as medicine lodges, for partitions, floor mats and wrappings, and for various purposes in the canoes. The leaves and stems are strung together by means of threads made of basswood fiber. In this they imitate a kind of textile well distributed throughout North America formerly.

FIG 114.
FINISHED WICKER BASKET.

The mats shown on Plates 21, 22, and 23 of Dr. Walter J. Hoffmann's paper* on this tribe are made from the inner bark of the cedar, cut in strips averaging one-half inch in width, in mixed, twilled, and checker weaving, which, combined with the native colour of the material and dyed strips, produce the greatest variety of diaper patterns. They do not differ essentially from Captain Gaillard's mat just described.

The baskets of the Menomini resemble those of the eastern Canadian Indians. A log of elm wood is beaten until the space between the annual layers of growth is destroyed; the thin strips are then pulled off, cut to a uniform width, and scraped as smooth as possible. At present, gauges of steel are used for the purpose. The weaving is done in checker, twilled, and wickerwork. A section of the beaten log, showing the annual layers loosened, the mallet of wood, and the modern

* Fourteenth Annual Report of the Bureau of Ethnology, 1896, p. 260.

Plate 122. See page 273

TWILLED MATTING FINISHED IN ONE DAY BY A CHIPPEWA SQUAW OF GRAND MARAIS, MINN.

Photographed by D. D. Gaillard

knife, resembling the "man's knife" throughout all the northern tribes, are shown in figs. 110 to 112. For the finer kinds of bagging the inner bark of the young sprouts of basswood is employed. It is removed in sheets and boiled in water with a quantity of lye. This softens the fiber and prepares it for the next process, which consists in pulling bunches of the boiled bark forward and backward through a hole in the shoulder blade of the deer. The fiber is twisted into yarn and made into cord or twine by winding on the thigh with the palm of the hand. This advance in the preparation of the textile elements paves the way for twined weaving.

Fig. 1, Plate 123, is an example of hexagonal weaving in a Mackenzie River snow-shoe in which the vertical elements answering to warps are crossed and not interlaced, and the fabric is bound together by the weaving in and out of a single rawhide thong. Fig. 2, on the same plate, illustrates the next step in the weaving, and is suggestive of a feature in the twilled basketry taken from graves in a cemetery at Ancon, Peru, namely, the method by which a bar of the snow-shoe frame enters into the weaving and widens the meshes. Most beautiful effects are produced on the surface of these snow-shoes by the different methods of administering the warp. This has been carefully worked out by John Murdoch in his paper upon the Eskimo of Point Barrow, Alaska,* and is referred to here simply to show how the methods of weaving in basketry are to be seen in other materials for other purposes.

In fig. 3, same plate, the warps at certain points in the manipulation are twisted in pairs about each other, a technical process in vogue throughout middle America, beginning as far north as the Mohave country in southern Arizona. It might be called the first step in lace-making. Fig. 4, same plate, introduces another element of complexity wherein the warp elements, instead of being twisted around each other, are

* Ninth Annual Report of the Bureau of Ethnology, 1892, pp. 342–352.

wrapped once or twice about the weft, so that the primitive lace work is effected both vertically and horizontally.

Charles C. Willoughby, of the Peabody Museum, Cambridge, Massachusetts, is of the opinion that coiled basketry was used among the Ojibwa Indians (Chippewa) on the Great Lakes before contact with the whites, and mentions very old specimens now in the possession of that museum, and others have been seen in private collections. The foundation coils are of sweet grass and about one-quarter of an inch in diameter. In some very old specimens the sewing is done with looped stitches, being continuous from the edge toward the center of the basket, and not following the coils, as is usual. He also finds the following references to old basketwork of the New England Indians. (See Plate 124.) Gookin is quoted, writing in 1674, with the following words:

> Several sorts of baskets, great and small, some of them hold four bushels or more, and so on downward to a pint. . . . Some of these baskets are made of rushes and some of bents (coarse grass), others of maize husks, others of a kind of silk grass, others of a kind of wild hemp, and some of bark of trees. Many of these are very neat and artificial, with the portraitures of birds, beasts, fishes, and flowers upon them in colours.

The soldiers under Captain Underhill, after destroying the Pequot fort in Connecticut in 1637, brought back with them "several delightful baskets." Brereton (1602) found baskets of twigs "not unlike our osier." Champlain saw corn stored in "great grass sacks." Josselyn writes, "Baskets, bags and mats, woven with bark of the lime tree and rushes of several kinds, dyed as before, some black, blue, red, yellow." In 1620 the Pilgrims found on a cache at Cape Cod "a great new basket, round and narrow at the top, and containing three or four bushels of shelled corn, with thirty-six goodly ears unshelled." The New England Indians were probably not less expert basketmakers than other tribes to the west and south. Does not the fact that the three distinct forms of weaving—

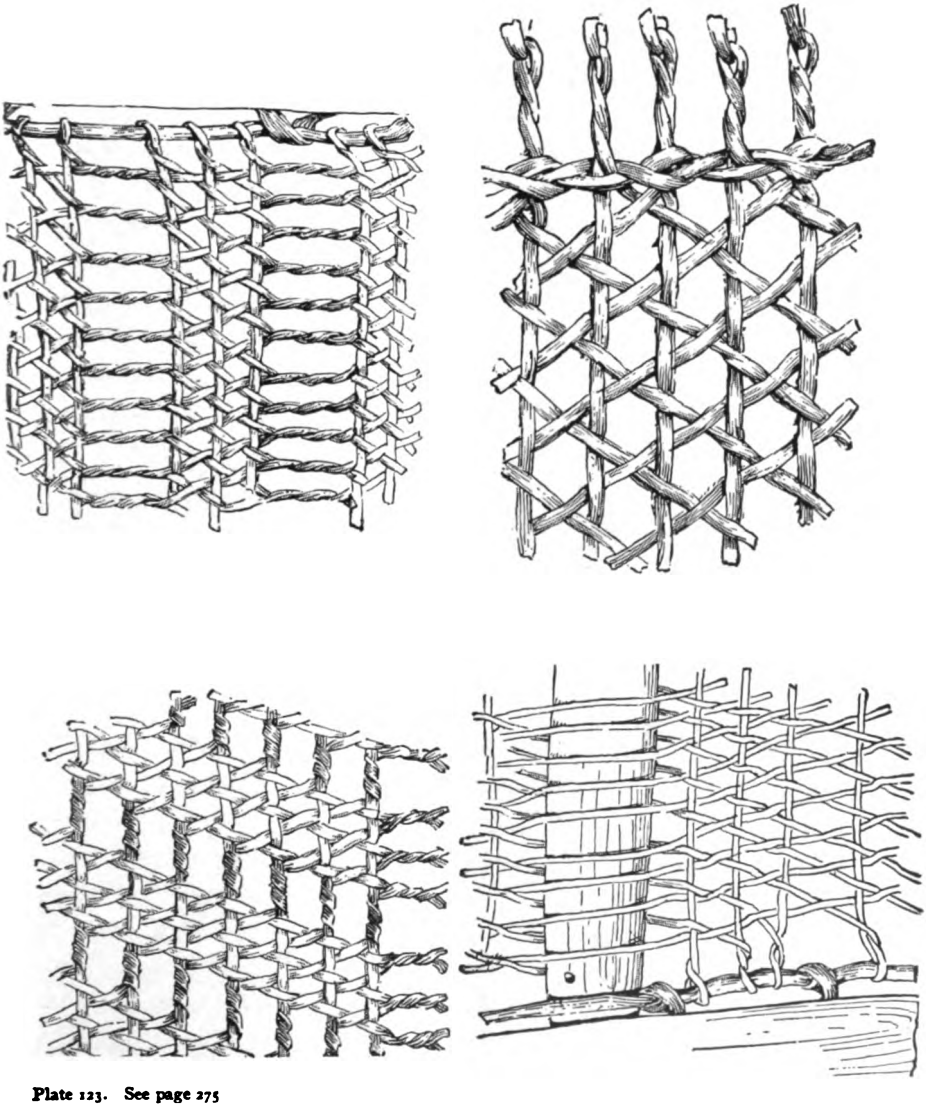


Plate 123. See page 275

HEXAGONAL WEAVING, WITH TWINING, ON A MACKENZIE RIVER SNOW-SHOE

Collections of U. S. National Museum

twined, checker, and coiled—still found among the Ojibwas, seem to indicate a survival of these types from prehistoric times all over the great Algonkin area? A few years back this type of coiled work was more in vogue than at present. (C. C. Willoughby.)

The next specimen described will take the reader a long way from the Great Lakes. Plate 125 shows the detail of a flat coiled basket of the Eskimo about Cumberland Inlet, eastern Canada. The foundation likewise contains a bundle of straws, but badly put together and sewed with sinew thread, the stitches being wide apart and caught beneath a few straws of the preceding coil. The bottom is flat, and the walls are drawn in so as to give a compressed shape. This interesting specimen has been many years in the National Museum, and is credited to Captain C. F. Hall, the arctic explorer. It may be compared with others of the same type from the southern Canadian border. Catalogue No. 10,203; height, 1¾ inches. A much later specimen, also from the Eskimo, is shown in the next plate.

Plate 126 is openwork basketry of the Eskimo of Davis Inlet, eastern Canada. The foundation is of straw and the sewing is done in the same material, the stitches merely interlocking. The noteworthy characteristic of the basket is the slight amount of sewing in certain portions. The bottom is not unlike the work of the western Eskimo, and, indeed, is a typical illustration. There is a little splitting of stitches, but probably not designed. On the sides the openwork is produced by wrapping the foundation with straw for one-half an inch and then sewing, as in ordinary coiled work, the angles to the coil below. This may be compared in the wrapping with the openwork coiled basketry of the Kern County Indians in California. (See fig. 196.) Sewing of exactly the same style is to be found in northern Europe, and the suggestion is made that this particular method among the eastern Eskimo is an acculturation. To come nearer home, coiled basketry in

raffia that is taught in the schools is largely in this wrapped and sewed method. The Eskimo of this area were for centuries in contact with Norse settlers. This specimen is 8¼ inches in length, and was collected by L. M. Turner.

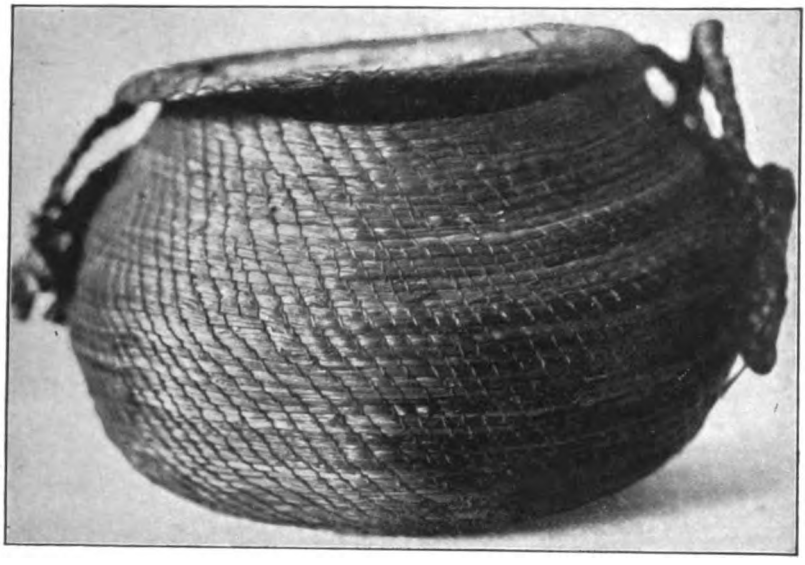
Plate 127 gives the profile and inside view of a shallow coiled basket tray of the Comanche Indians, living on the plains east of the Rocky Mountains, used principally in gambling. The foundation is of rods and splints, the sewing with leaf of yucca (*Yucca arkansana*). Especial attention is invited to the furcate stitches, designedly and symmetrically split. This technic relegates the basket to the Ute or Shoshonean area, west of the Rockies. The Comanches belong to the Shoshonean family. Its diameter is nine inches.

In the National Museum are four small, dish-shaped, coiled gambling baskets, Catalogue Nos. 6,342, 8,427, and 153,932, gathered from the Rees or Caddoan Indians, the other one from the Mandans, who are Siouan. These baskets are made from willow, on a two-rod foundation, but roughly assembled and sewed with splints of the same material. The borders are all well done in false braid. No more interesting specimens are to be found in this collection.

There are four other gambling baskets of the same type, but of different material, which are fairly made. The foundation is a single stem of, perhaps, willow, the sewing in the leaves of yucca (*Yucca arkansana*). Catalogue Nos. 152,802, 152,803, 165,246, and 165,765, were gathered from the Cheyenne, Arapaho, and Kiowan Indians in Indian Territory.

Finally, modern pedagogy has found in the long leaves of the Georgia pine a material by means of which poor people may weave a little of the sense of beauty into their lives.

Plate 128 is a covered basket, made near Augusta, Georgia, from the leaves of the pine, by a native Georgia woman, under the instruction and patronage of Mrs. Percy H. Babcock, of Hudson, Ohio. The sewing-material is tough, brown linen thread. The interesting characteristic in this specimen is



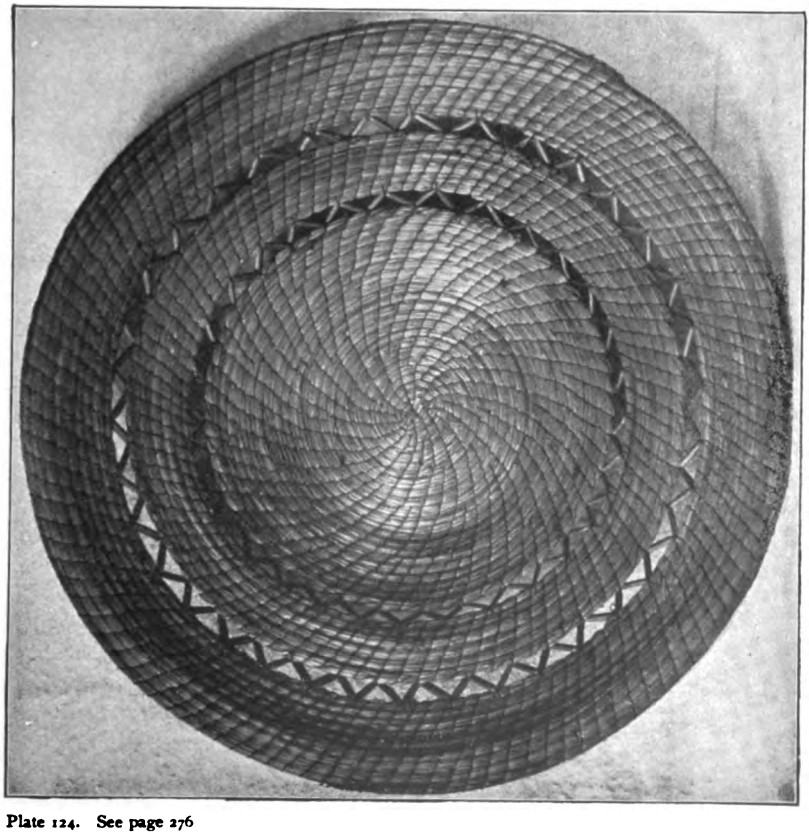


Plate 124. See page 276

COILED BASKETS MADE BY OJIBWA INDIANS ABOUT LAKE SUPERIOR

Photographs by C. C. Willoughby

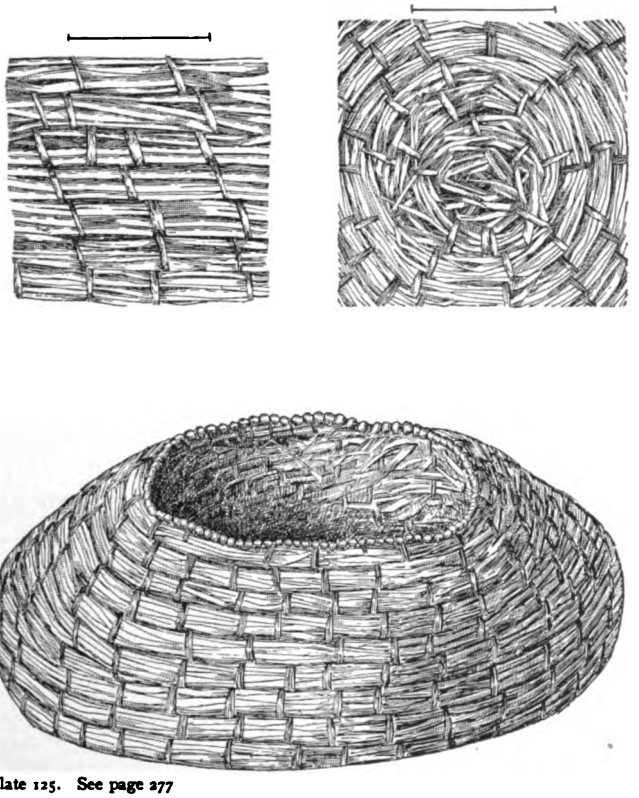
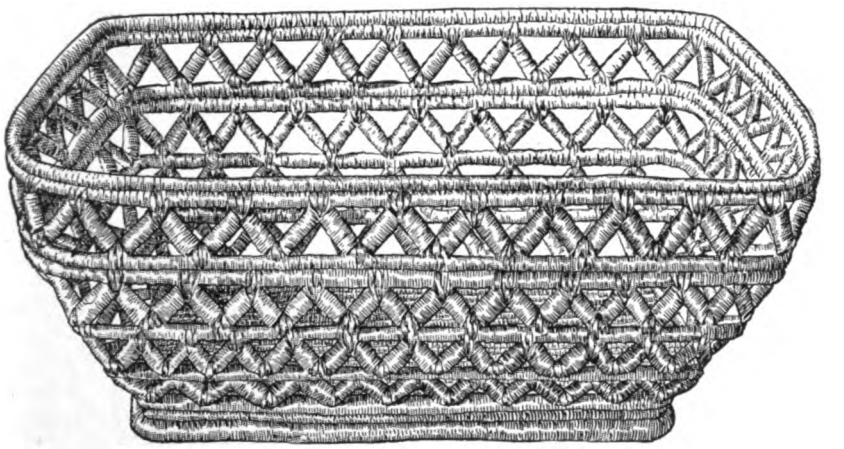
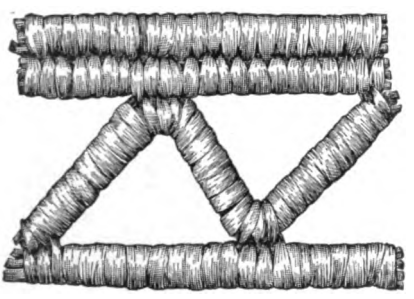


Plate 125. See page 277

COILED BASKETS OF GRASS AND SINEW, FROM ESKIMO ABOUT CUMBERLAND INLET, EASTERN CANADA

Collections of U. S. National Museum





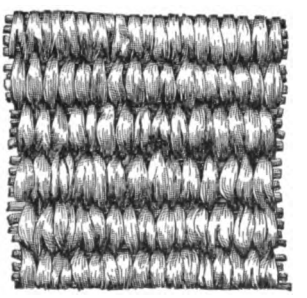
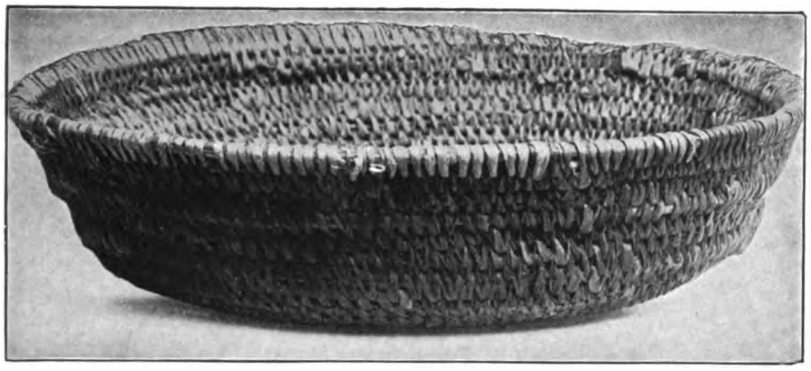


Plate 126. See page 277

OPENWORK COILED BASKET, FROM ESKIMO ABOUT DAVIS INLET, EASTERN CANADA

Collections of U. S. National Museum



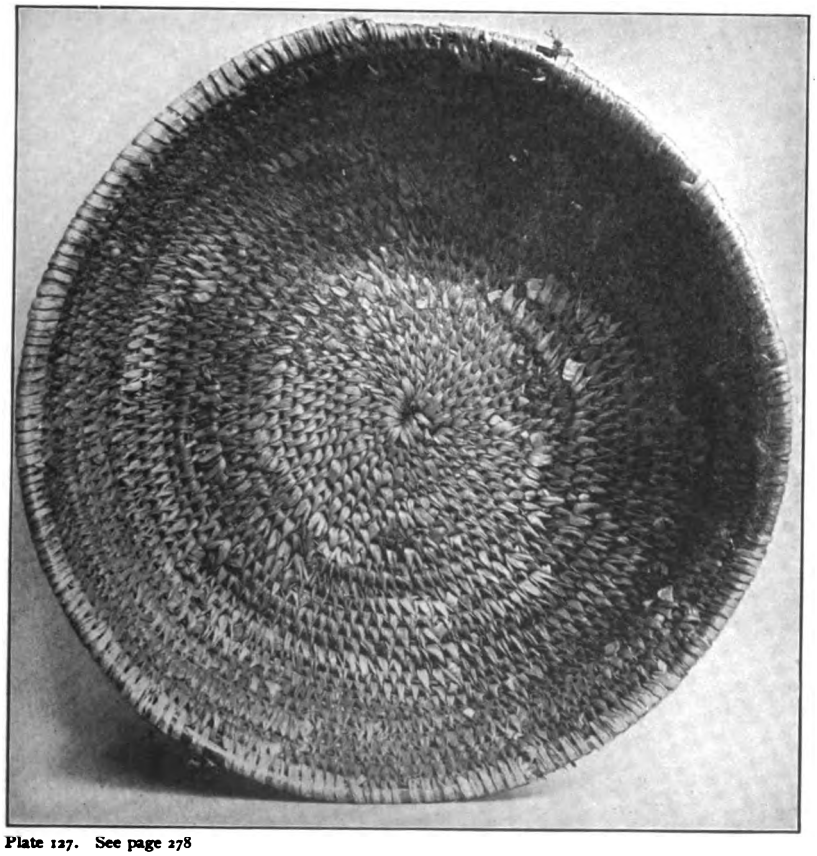


Plate 127. See page 278

COILED GAMBLING BASKET OF THE COMANCHE INDIANS, INDIAN TERRITORY

Collections of U. S. National Museum

Plate 128. See page 278

COVERED COILED BASKET IN PINE STRAW, MADE BY A NATIVE GEORGIAN WOMAN

Collections of U. S. National Museum

the undesigned resemblance between the stitching and that on the Hudson Bay Eskimo specimen, as well as the old Chippewa specimen in the Peabody Museum, in Cambridge, Mass.

Coiled work, as was shown in the chapter on weaving, changes to lace work by omitting the hard foundation. In this Eastern region two witnesses, far apart in time, are here to testify to the widespread ancientness of a coiled work now universal in tropical America.

Figs. *a* and *b*, Plate 129, represent the method of weaving in the game bags, or muskemoots, of the Dog Rib and other Athapascan Indians in northwestern Canada, for domestic purposes. These tribes and their relatives in central Alaska use the birch-bark vessels for all sorts of domestic purposes. For transportation they do not make regular baskets, but buckskin wallets, in which a process of coiled weaving now to be described is employed. The sides and borders of the game bags are of dressed skin of moose and reindeer. For the body of the bag the same material is cut into fine string and rolled. This material is called "babiche." It is quite evident that before the introduction of the steel knife this material was much coarser, as may be known not only from the game bags, but also from the snow-shoes. Fig. *b*, a small section from one of the muskemoots, will show how the work is done. The border of the bag on its lower edge is pierced at equal distances for the reception of the first row of weaving. Through these holes the babiche is strung by half stitches, or what is called "button-hole stitch." The work proceeds in the same manner round and round until it is desirable to make a variation in the technical process. In the middle of the drawing it will be seen how this is done. The end of the babiche is carried through a stitch in the row above and twisted one and a half times about itself. As many turns as are desirable can be made, and thus the ornamentation may be varied. This method of coiled work, the first described in the table of methods (page 90), does not occur again among the Indians

until the borders of Mexico are reached, where the tribes in their carrying nets, and farther south in their wallets and hammocks, employ precisely the same method of workmanship. This specimen, Catalogue No. 2,023, with several others in the United States National Museum from the Dog Rib Indians of northwestern Canada, was collected by Bernard R. Ross.

Warren K. Moorehead found examples of the muskemoot weaving in the Hopewell mounds, Ohio. There was nothing but an easy portage here and there to hinder passage by water from the mouth of the Mackenzie to the neighborhood of the Hopewell mounds. Examples in the Peabody Museum, Massachusetts, and in the Field Columbian Museum, Chicago, prove the identity of technic. (See figs. 115 and 116.)

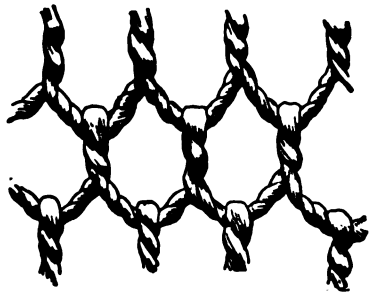


FIG. 115.
COILED BASKETRY.
Hopewell Mound, Ohio.
After C. C. Willoughby, Peabody Museum.

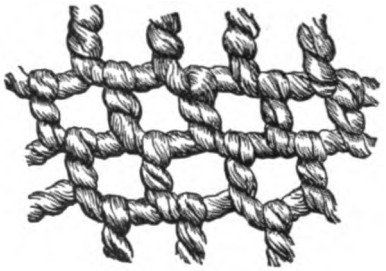
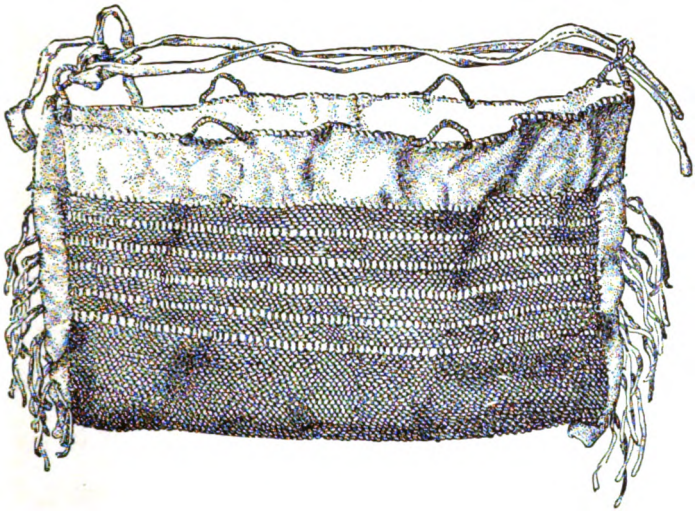


FIG. 116.
COILED BASKETRY.
Hopewell Mound, Ohio.
After C. C. Willoughby, Peabody Museum.

There is a general impression that the baskets of the ordinary soft character described were used by these eastern peoples in the manufacture of pottery, and were ruthlessly destroyed in the burning, but Holmes's investigations tend to show that pliable materials had been almost exclusively employed. In the Pueblo region the case was quite different, though there is no evidence of the burning of the basket.

The twined wallets or other fabrics used were removed before the vessel was burned or even dried. In many cases handles and ornaments were added after these impressions



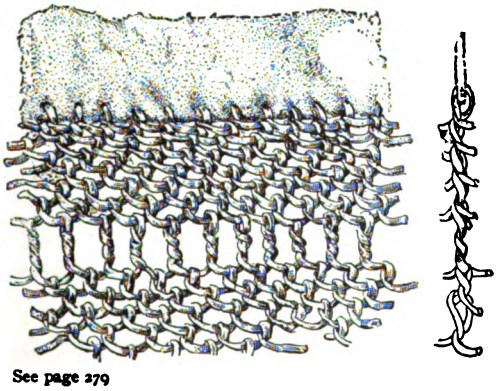


Plate 129. See page 279

COILED AND TWISTED BABICHE IN DOG RIB GAME BAGS, NORTHWESTERN CANADA

Collections of U. S. National Museum

were made, also incised designs were executed in the soft clay after the removal of the textile.

It is quite evident that textile impressions were used to enhance the beauty of the vessel, not to support the clay in process of construction.

In many examples, notably the salt vessels of Saline River, Illinois, the fabric was applied after the vessel was finished, inasmuch as the loose threads sag or festoon toward the rim. Simple cord markings arranged to form patterns have been employed on many examples. And in those cases where basketry textile was pressed on the surface, it was not the

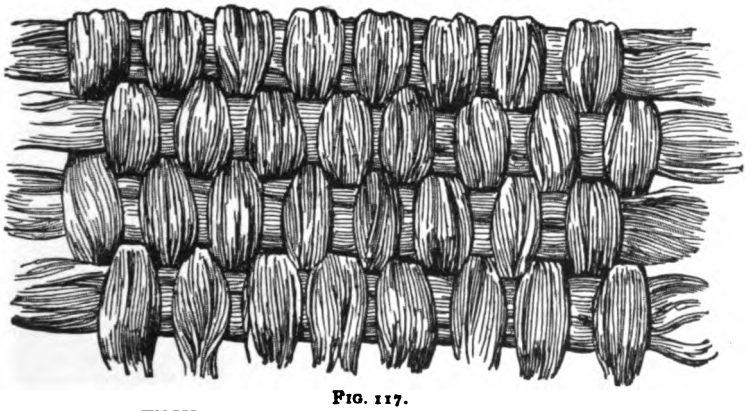


FIG. 117.
WICKERWORK FROM CAVE IN KENTUCKY.
After W. H. Holmes.

common, careless weaving, but the elegant designs, as will be seen in the plates.

The textile markings on pottery, ancient and modern, are of five classes:

1. Impressions on the surface, made by rigid basketry, used in moulding and modelling.

2. Impressions of pliable fabrics on the soft clay.

3. Impressions of woven textures used over the hand or on a modelling or malleating implement.

4. Impressions of cords wrapped about modelling or malleating paddles or rocking tools.

5. Impressions of bits of cords or other textile units, singly or in groups, applied for ornament only, and so arranged as to give textile-like patterns.*

If the reader will turn to the classification of basket-making methods (page 6), it will be noticed that many of these are to be found in the ancient basketware impressed on pottery by the eastern Indians. Referring to Mr. W. H. Holmes's paper, openwork checker weaving is very rare among impressions on clay. Foster illustrates one example on pottery from a mound on Great Miami River, Butler County, Ohio.

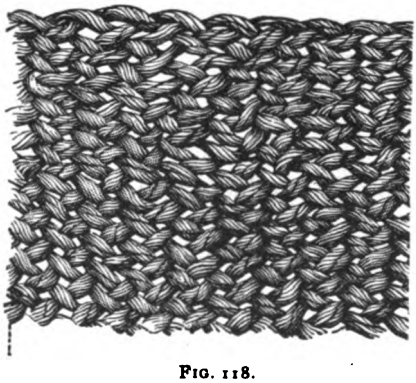


FIG. 118.
CHARRED FABRIC FROM MOUND.
After W. H. Holmes.

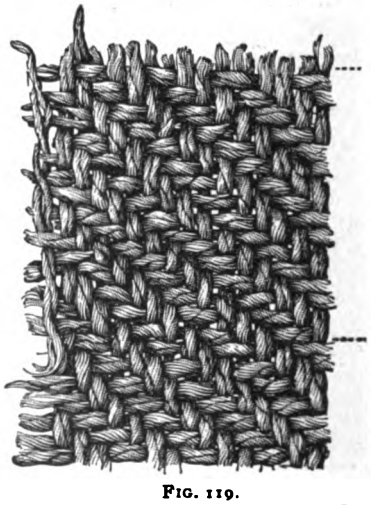


FIG. 119.
CHARRED FABRIC FROM MOUND.
After W. H. Holmes.

Checkerwork of the close type, on the other hand, was practised in nearly all the Atlantic States, upon the testimony of pottery fragments.

From potsherds found in the State of New York, closely packed checkerwork patterns have been copied. Charred fabrics from mounds in Ohio reveal the coarsest kinds of oblique checker weaving. Holmes illustrates an example in which the oblique work imitates mat plaiting without a frame,

* W. H. Holmes, American Anthropologist (N. S.), III, 1901, pp. 397–403.

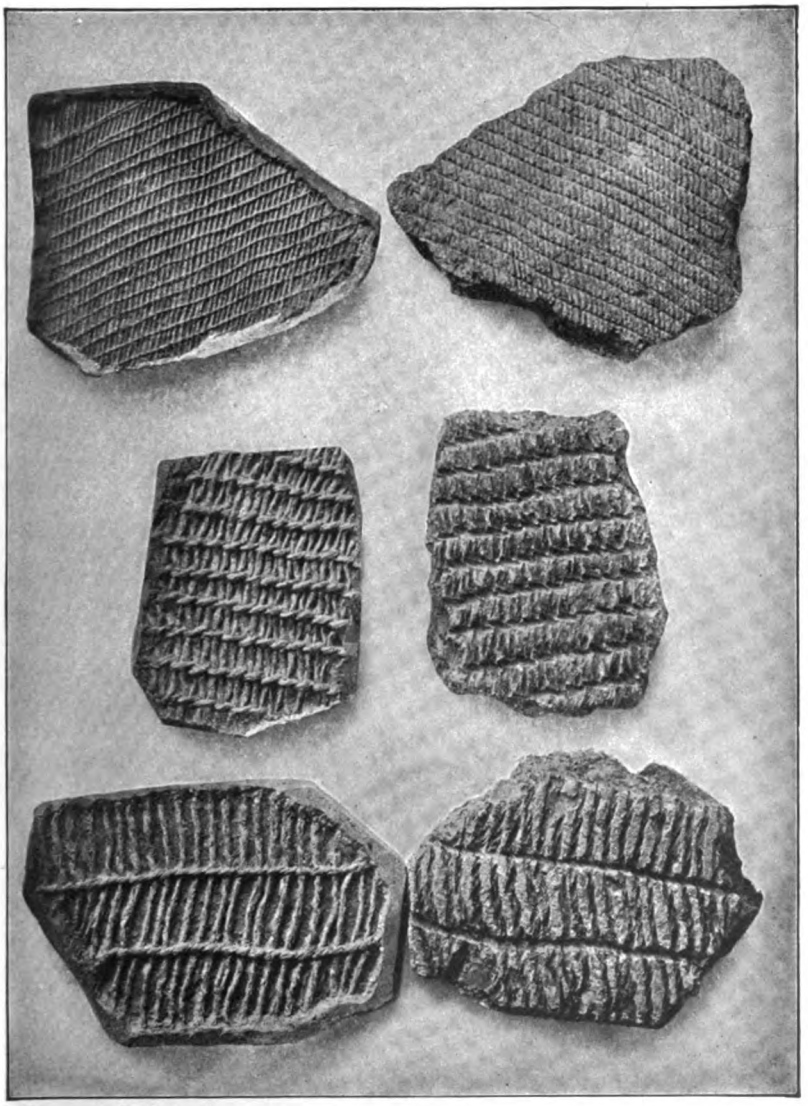


Plate 130. See page 285

CASTS OF POTSHERDS, SHOWING TWINED WEAVING AMONG ANCIENT MOUND-BUILDERS. AFTER WILLIAM H. HOLMES

worked from a corner. The selvage and the weft cross the texture obliquely.*

Not only checkerwork, but twilled work in cane and in twine, and wickerwork in soft material, have been brought to light by cave explorations in the Western and Southern States. In the Third Annual Report of the Bureau of Ethnology, Holmes figures an example of wickerwork in soft materials, from a cave in Kentucky. (See figs. 117, 118, and 119.)†

To show the distribution of this ancient style of weaving, reference is here made to:

1. Coarse, oblique, checker, twilled work from Ohio, made of twine.

2. In the same volume (fig. 12) is shown a fragment of twilled cane-matting from Petite Anse Island, Louisiana. It has been preserved all these years by salt. (See fig. 126.)

3. Plate 2, in Holmes's report, shows a mat of split cane from a rock shelter on Cliff Creek, Morgan County, Tennessee. It is 6 feet 6 inches by 3 feet 4 inches. The variety of twilled effects and the patterned border leave nothing to be desired.

4. In a mound near Augusta, Georgia, a fragment of twilled matting was found attached to the surface of a bit of copper (Holmes's fig. 11). The interesting feature of this example is that on the side shown the warp passes over one and under four, the weft over four and under one. His fig. 15, from Alabama, is similar, only the formula is three and one.

5. Fig. 14 is from an impression of twilled weaving on a fragment of pottery found in Polk County, Tennessee. Three characteristics of this fragment claim attention. The warp is of fine twine, the weft of coarse yarn; the work is over two, both in warp and weft; the weaving is oblique. The effect

* See Thirteenth Annual Report of the Bureau of Ethnology, 1896, pl. VII, fig. *c*.

† Thirteenth Annual Report of the Bureau of Ethnology, 1896, pl. VII, figs. *c* and *d*.

of this technic is pleasing and unique, the components being bands of closework alternating with bands of openwork, made up of sloping elements, giving great variety to unity.

It will be seen that the checker and the twilled work in ancient eastern North America had about the same distribution as now.

Twined weaving was common throughout the Middle and Eastern States of the Union in prehistoric times. Fabrics of this class were employed by the ancient potters in nearly all

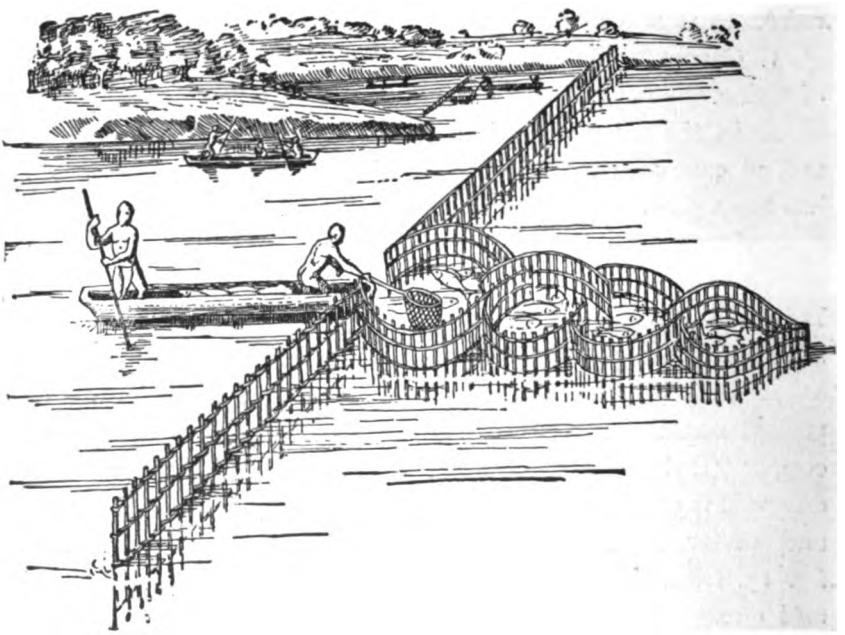
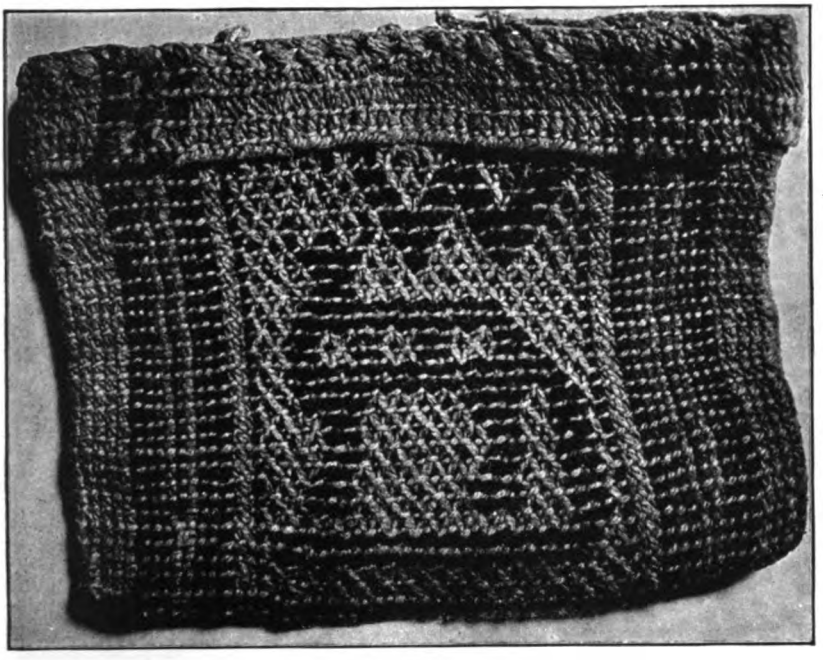


FIG. 120.
TWINED FISH TRAP.
Virginia Indians.
After Thomas Hariot.

of the States. Every variety of twined weaving known to the modern Indian was practised by the old-time people—the Mound Builders especially. Holmes figures examples from pottery in Tennessee, Georgia, Arkansas, Illinois, Missouri, and Iowa. Even the intricate and delicate forms of twined



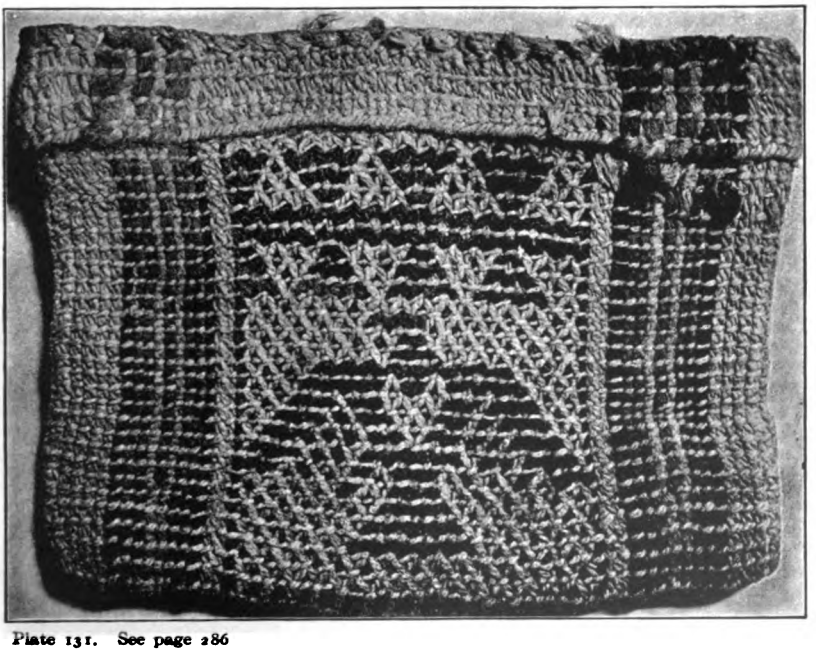


Plate 131. See page 286

OJIBWA TWINED WALLET IN OPEN WEAVING, SAGINAW COUNTY, MICHIGAN

Photographed by William Orchard
Collections of Am. Mus. of Nat. Hist., N. Y.

weaving described on page 71 as zig-zag or divided warp and crossed warp were well known.

The ancient pottery of the Mississippi Valley furnishes many examples of this, as will be seen in Holmes's papers.*

Traces of wattlework are found in the mounds of the Lower Mississippi Valley, where imprints of the interlaced canes occur in the baked clay plaster, with which the dwellings were finished. In the same connection, John Smith, Butel-Dumont, Du Pratz, Lafitau, and John Lawson are quoted on the use of wattling for houses, inclosures, biers, and burial platforms. A fish trap, with long wings, done in twined wattling, is figured in Hariot, and here reproduced from Holmes. (See fig. 120.)

The illustration shows a warp of stakes driven into the bottom of the stream, close enough together to let the small fry pass through and to offer no impediment to the flow of water. Brush or poles constitute the warp. The rivers of the Atlantic coast teemed with shad, herring, rockfish, sturgeon, and more, in the spring, and it is permissible to infer that twined fish traps were universal there.

Plate 130, thanks to the preserving care of potsherds, introduces the reader to the old basketmakers of no one knows how many centuries ago. From three fragments, selected out of myriads, and shown in the plate on the right hand, the cast on the left being in plaster, one might think himself studying specimens from the Aleutian Islands or the Great Interior Basin. The figure at the bottom is in plain openwork of twined weaving, the material being a soft bast, perhaps of native hemp. Hundreds of wallets indistinguishable in texture from this are now brought from around Bristol Bay Alaska. The figure in the middle is openwork twined weaving

* Prehistoric Textile Fabrics of the United States, Third Annual Report of the Bureau of Ethnology, 1884; Prehistoric Textile Art of Eastern United States, the same subject, Thirteenth Annual Report, 1896; and A Study of the Textile Art, etc., Sixth Annual Report, 1888.

in diagonal pattern. The warp strands are in pairs and flexible, making the interstices triangular, and giving to the weaving the appearance of "faggoting." If the weft were forced close together, the texture would be the common twilled work of the Pacific slope. The upper figures are also twined, but of rarer style, the warp being set diagonally. This figure is worthy of note in two respects. The workmanship in twisting of the threads is superb. One would have to look a long time through a collection of twined weaving of the present day to see threads nearly so fine. Not until the outermost island of the Aleutian chain was reached would the specimen appear. The other characteristic is the sloping warp, a thing of rare occurrence in twined weaving.

A further glance at basketry technic preserved in impressions on pottery and in caves shows plain twined weave, open or closed, with vertical or oblique warp; twilled weaving in twined weft and twined weaving with zigzag warp; three-ply twined weaving, and a style of twined work, which for exhausting possibilities of variety in warp treatment will vie with any modern example. The material is good twine, the warp is administered in groups of sixes, oblique toward the right. The weft is a two-ply twine, which, in crossing the warp, takes in a strand at each half-turn and is twisted tightly in the open spaces. The pattern is varied by bands of close weft in three rows, above and below which the groups of six warp strands are split into threes. Attention is called to Plate 8, in the Thirteenth Bureau Report, where is shown ancient twined work preserved by being wrapped about copper celts.* (See figs. 121-122; also Plate 107.)

Plate 131 represents an open-twined wallet of the Ojibwa Indians (Algonquian family), at Angwassag Village, near St. Charles, Saginaw County, Michigan. The native name is Na Moot, and it is made from the inner bark of the slippery

* Thirteenth Annual Report of the Bureau of Ethnology, 1896, figs. 21–26, and Plates VII and VIII.

elm (*Ulmus americana*). Other bags of the same technic in the United States National Museum are from the elm bark associated with red and black yarn. The technic of these wallets is so interesting in the survival of ancient weaves that they justify a special description. The weft is plain twined weaving; all the ornamentation, therefore, is effected by means of the warp, which is partly vertical, but more of the zigzag type seen in many Aleutian Island wallets. In all of the specimens examined, the warp is made up of twine, partly in the material of the weft and partly in coloured yarns. The diameter of the warp twine, especially the yarns, seems to be greater than the length of the twists in the weft, so that there is a crowding which brings one colour to the front and leaves another colour inside —that is, the figures that are brown on the outside will appear in yarn on the inside and the reverse. To be more explicit, beginning at the lower edge of any one of these wallets, the warp may be in pairs, the elements of which separate and come together

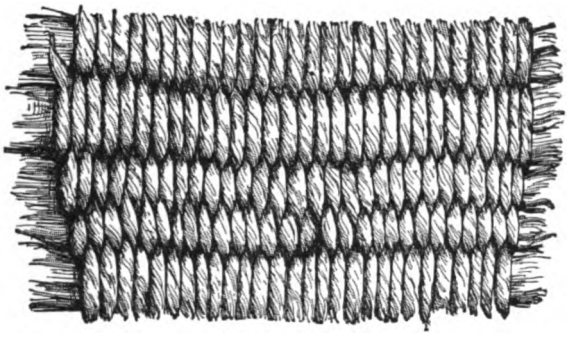


FIG. 121.
TWINED WEAVE FROM ANCIENT POTTERY.
Tennessee.
After W. H. Holmes.

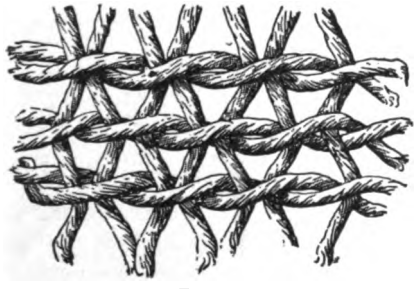


FIG. 122.
TWINED WEAVE FROM ANCIENT POTTERY.
Tennessee.
After W. H. Holmes.

alternately in the rows of weaving. On the outside of the bag, two elm-bark warp strands will be included and appear; in the next half-twine two yarns will be included and show on the inside of the wallet. After the zigzag process goes on for a short distance, the weaver changes her plan, omits the bark or the yarn warp altogether, but continues the twining process, catching the warp in every other half-turn of the twine. Again, there will be a row or two of ordinary twined weaving with straight warp, when she returns to her zigzag method, covering the entire surface therewith. At the top of the bag, an inch or less of plain twined weaving, in which the warps are vertical and included in pairs, brings her to the outer border, where all the warps are twisted together and turned back to be fastened off in the texture. In an old example in the National Museum, long, cut fringes are sewed to the upper margin and to the sides of the bag.

The photographs of the twined bag shown in Plate 131 were taken by William Orchard, of the American Museum of Natural History, and presented to the National Museum by Harlan I. Smith. On one side a mountain lion and on the other an eagle with geometric figures are shown in black. The technic of this particular example, from left to right, would be five vertical rows of plain twined weaving; nine rows of mixed warp, but plain weaving; a course of braided warp in which the four elements of two rows of warp are brought together and included in the twine. On the other side is a similar administration. The middle portion shows zigzag twined weaving, figured. Above this is a row of three-ply twined weaving, as among many of the western tribes; above this, three rows of plain twined weaving in openwork, including all the warps. At the top, the warps are twisted and fastened into the texture. It must be clearly understood that the figures which show black on the outside—that is, the eagle and the lion—will be white on the inside, necessarily. The colours used in the small specimen of the National Museum are the

natural tints of the bark mixed with brown, black, and blue yarns. The National Museum is indebted to Andrew John, a Seneca Indian, of New York, for a number of specimens of modern Iroquoian twined ware from corn husks.

There was a decided lack of coiled basketry in all this vast region. Every kind of hand-woven ware was known. Algonquian, Iroquoian, Siouan, and Muskhogean tribes of the present, and all the cave-dwelling and mound-building ancients, seem, so far as the evidence points, to have known little of coiling.

From this hasty survey of ancient hand-weaving in basketry and the other receptacles, as well as in matting, webbing, sandals, and such products of the textile art as resemble basketry, it is now permissible to examine their modern representatives in the southern portions of the same area.

In the States of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, and Louisiana are many Indians still living, remnants of the Cherokees (Iroquoian), Choctaws, Creeks, Chickasaws, and Seminoles (Muskhogean), and the almost vanished Attakapas and Chetimachas. Some of them were removed fifty years ago into the Indian Territory. Through the lowlands of these States grow the interminable cane-brakes, and from the split cane all these tribes make their basketry. They follow the twilled pattern of weaving. Even now there may be purchased in Mobile, New Orleans, and other Southern cities, little baskets of yellow, red, black, and green cane woven in twill, crossing with the woof two or more warp splints, and managing the checks so as to produce diamonds and various zigzag patterns on the outside. The Choctaws make a basket, oval at the top and pointed below, for presents, averring that this shape imitates the heart, which always accompanies every gift. The handles of their basketry are very clumsily put on, marring greatly the appearance of the otherwise attractive object.

Often in weaving, two thin strips are laid together, the

soft sides inward. The evident motive in doubling the thin strips is to have both sides of the basket or mat glossy and smooth. Further on, it will be noted that in twined weaving, where the strands of the weft are from split roots, both sides are rendered smooth by revolving each strand half a turn as it passes through between the warp stems. (See page 317.)

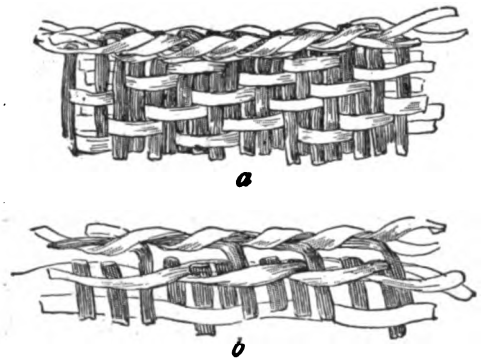


FIG. 123.
DETAIL OF TWILLED BASKETRY BORDER.
Choctaw Indians, Louisiana.
Cat. No. 24,143, U.S.N.M. Collected by Father Roquet.

Figs. 123 and 124 show the detail of twilled basketry among the Southern tribes, both in the coarser and finer varieties. In Fig. 123, *a* and *b*, will be seen the border. Each weft strand crosses four warp strands. In this example the warp, however, does not cover each time the same number of weft strands; the consequence is a nearly horizontal diagonal effect in the pattern. To form the border, a few of the warp filaments are bent down and inclosed in a wrapping of the same material. Underneath this is a row of twined weaving, which holds in place those warp elements that do not enter into the

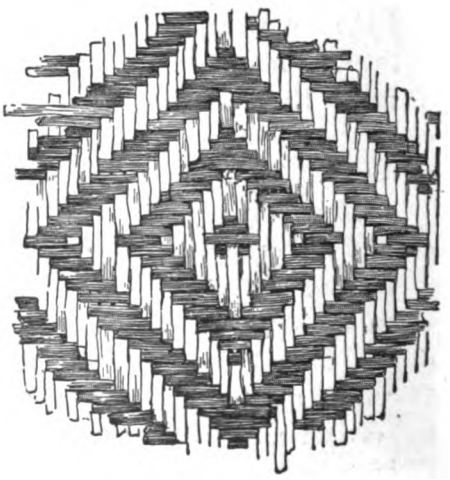


FIG. 124.
BORDER OF TWILLED BASKETRY.
Choctaw Indians, Louisiana.
Cat. No. 24,143, U.S.N.M. Collected by Father Roquet.

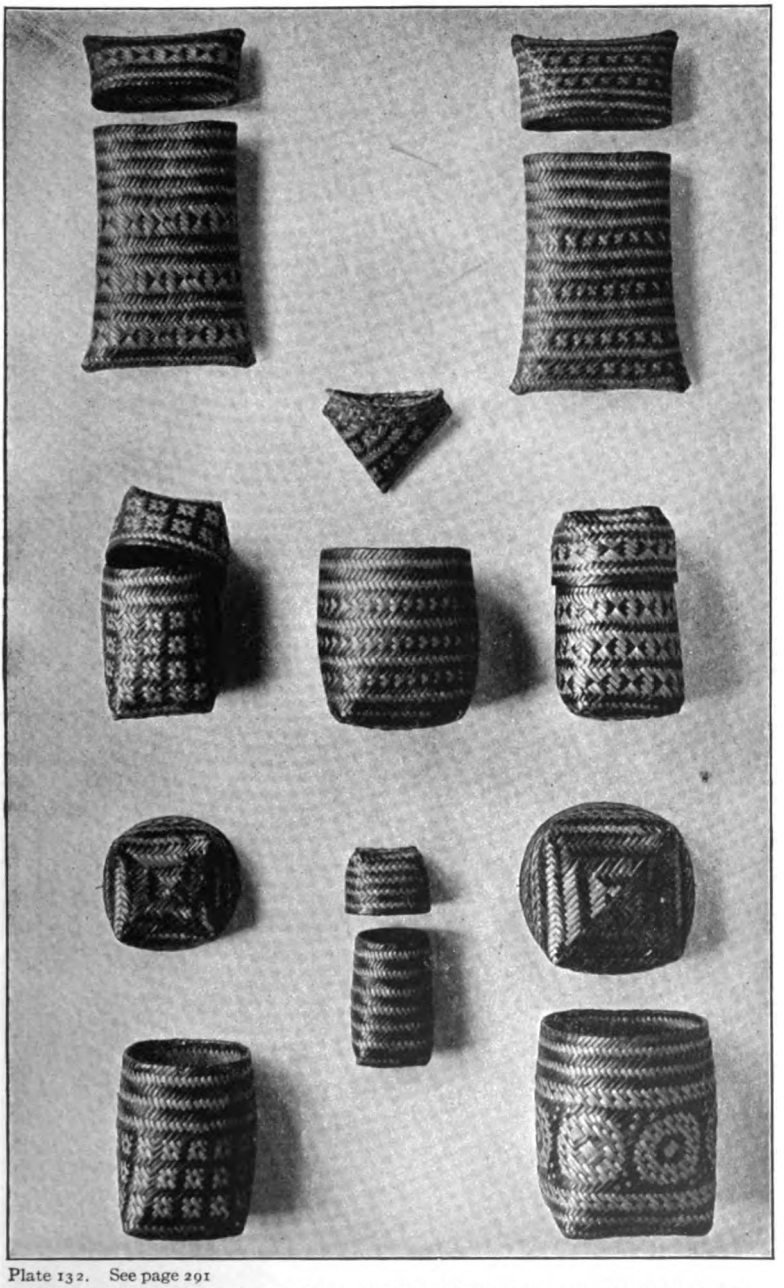


Plate 132. See page 291

TWILLED BASKETRY OF SPLIT CANE, MADE BY THE CHETIMACHAS OF LOUISIANA

Collections of U. S. National Museum

texture. A much neater example of work of this kind is shown in the next figure, where the filaments are more carefully prepared and manipulated and the border more neatly finished, but the technical process is the same. The artistic effect of plain twilled work is shown in this example.

Fig. 124 exhibits the process of crossing in what might be called diaper or figured work. The effect is heightened by dyeing black one set of the filaments, either warp or weft. In that case, the figures stand out most prominently. The entire effect of this sort of weaving, however, is in the endless combination of rectangles, black and white, all having the same width and different lengths.

The basket shown in this dissected weaving is Choctaw, Catalogue No. 24,143, in the United States National Museum, collected by Father Roquet, of New Orleans.

Plates 132-133 represent the twilled basketry of the Chetimacha Indians, Chetimachan family, who have their home on Grande River and the larger part in Charenton, St. Mary's Parish, Louisiana. The name is derived from the Choctaw words, *tchuti*, "cooking vessel," *masha*, "they possess." Mr. Gatschet, in 1881, found about fifty individuals still living. The material of their work is the cane (*Arundinaria tecta*), and all of their weaving is in the twilled style of technic.

Compared with the work of the Choctaw (Plate 134) and their neighbours, the Attakapa (Plate 135), it is more picturesque and attractive, the colours being the original of the cane, red and yellow. Similar work is to be seen in the northern part of South America, especially in Guiana. The interesting feature of the Attakapa weaving is that frequently the specimens have the appearance of being double—that is, both the outside and the inside of the receptacle presenting the smooth surface of the cane. At once the work connects itself with matting found in the caves of Kentucky and Tennessee, and with Yaqui work in Mexico.

Plate 133 represents a fine collection of old Chetimachas in the collection of Mrs. Sidney Bradford, of Avery Island, Louisiana. They should be examined carefully, since they were posed so as to exhibit the technic of the various parts and the variety of symbolism.

Mrs. Bradford has identified the plants with which these Indians dye their basketry, the black being produced from the bark of the walnut (*Juglans nigra*) and the yellow from *Rumex verticellatus*. The red dye comes from the root of a plant, specimens of which are in the National Museum, but are not identified.

Plate 135 shows a small number of twilled basketry, made by the Attakapa Indians, living in Calcasieu Parish, Louisiana. They are the last remnant of an independent linguistic family once spread southward along the Texan coast. The baskets are made from the stems of the cane. The outer tough layer is split off and dyed, if necessary. It is then worked into twilled ware, which by the texture and variety of colors shows elegant designs.

These specimens, Catalogue Nos. 165,735 to 165,739, in the United States National Museum, were collected in Louisiana by Mrs. William Preston Johnston.

The Cherokee make the handsomest clothes-baskets, considering their materials. They divide large swamp canes into long, thin, narrow splinters, which they dye in several colours, and manage the workmanship so well that both the inside and outside are covered with a beautiful variety of pleasing figures; and though for the space of two inches below the upper edge of each basket it is worked into one, through the other parts they are worked asunder, as if they were two joined atop by some strong cement. The weaving begins at the bottom of the inner basket and is finished at the bottom of the outer one (compare page 484). A large nest consists of eight or ten baskets contained one within another. Their dimensions are different, but they usually make the outside

Plate 133. See page 292 FINE OLD TWILLED BASKETS OF THE CHETIMACHAS OF LOUISIANA

Collections of Mrs. Sidney Bradford

basket about a foot deep, a foot and a half broad, and almost a yard long.*

A type collection of this ware was made for the National Museum by James Mooney.†

Fig. 125 shows one of the oldest and most beautiful baskets in the National Museum, presented by Doctors Gray and Matthews, of the Army. Four bent poles constitute the framework. Those at the sides are 10 inches apart at the top, 4 at the bottom, and are quite concealed in the structure. The end pair cross these at right angles and descend 6 inches to afford a rest for the load. The carrying strap is of rawhide. The weaving is in twilled work, with diaper patterns made in narrow strips of bark, some having their outer, some their inner surface exposed.

FIG. 125.
TWILLED BASKET.
Arikara Indians.
Cat. No. 84,340, U.S.N.M. Collected by Gray and Matthews.

The weaving was done by an Arikara woman in Dakota. Now, these Indians are not Sioux, but belong to the Caddoan family, spread over Louisiana and Texas. It should not be surprising, therefore, to find baskets similar to those of the Cherokees and the Gulf tribes in their hands.

In close connection with wickerwork and checkerwork is

* James Adair, History of the American Indians, London, 1775, p. 424.

† Nineteenth Annual Report of the Bureau of Ethnology, 1900, p. 176.

twilled or diagonal technic from many localities, especially in the South. An interesting example is illustrated by Holmes.* The two elements, the warp and the weft, are of entirely different material, one a finely spun thread, the other a loose, coarse filament several times wider than the former, and are woven together in the ordinary plan of under two and over two, and yet the difference in the width and tension of the two elements produces a most charming effect, which is not lost, after many thousands of years, in the cast taken from the surface of the fragment. (See page 59.) An example of matting, also illustrated by Holmes, was taken from a piece of pottery found in Alabama. It is worked in the diagonal style, but on one side the warp passes over one and under three, and, consequently, though the matting was destroyed hundreds of years ago, it is certain that on the other side of the fabric the weft made a similar figure, but vertical. (See page 59.)

The caves of Kentucky furnish specimens of ancient textiles, preserved in nitrous earth, and fig. 117 is an illustration of one of these, revealing a wicker type of weaving in soft materials, not found on pottery, however.†

One of the most interesting examples of this ancient work is illustrated by Foster, also taken from a mound on Great Miami River, Ohio. It has a warp of twine, on which the weft is wrapped round and round. (See page 241.) Only one family of Indians, the Yuman, of Arizona, at present employ this technic in making baskets. (Fig. 13; compare fig. 14, in the chapter on processes.)

It is an interesting fact that the Andamanese, living halfway round the world, employ the same method of workmanship on their open fish baskets.

Fig. 126 is from the photograph of a specimen of ancient twilled matting from Petit Anse Island, near Vermillion Bay,

* Third Annual Report of the Bureau of Ethnology, 1884, p. 416, fig. 98.

† Third Annual Report of the Bureau of Ethnology, 1884, p. 403, fig. 67.

coast of Louisiana, presented to the Smithsonian Institution by J. F. Cleu, in May, 1866. Petit Anse Island is the locality of the remarkable mine of rock salt exploited during the civil war, and from which, for a number of years, the Southern States derived a great part of their supply of that article. The salt is almost chemically pure, and apparently inexhaust-

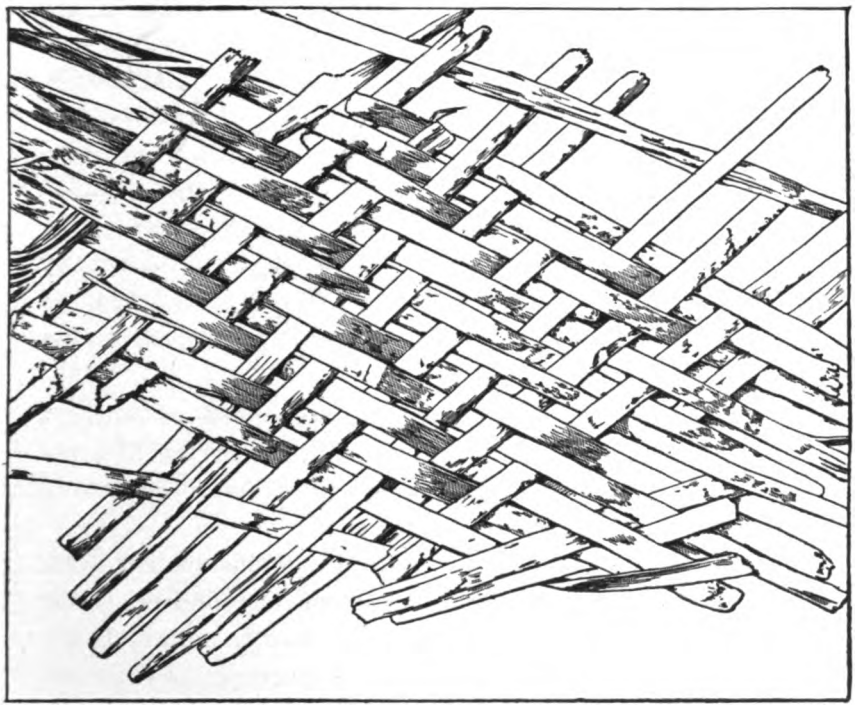


FIG. 126.
ANCIENT TWILLED MATTING.
Petit Anse Island, Louisiana.

ible in quantity, occurring in every part of the island, which is about 5,000 acres in extent, at a depth below the surface of the soil of 15 or 20 feet. The fragment of matting here photographed was found near the surface of the salt. No vast antiquity can be argued on this account, but the specimen is without doubt very old and a relic of the weavers who lived a long time before the discovery of America. The material

consists of the outer bark of the common Southern cane (*Arundinaria tecta*), and has been preserved for so long a period both by its siliceous character and the strongly saline condition of the soil.

The Alaskan Region

> There is a charm in the name of such Indian material as spruceroot, wild rye, and cedar bark, but they would be useless to us without the Indian touch.—Mary White.

For convenience of study, a line may be drawn across the map of North America from Dixon Entrance northeastward, so as to have Queen Charlotte Islands and the makers of coiled basketry that are inland to the north of it. The tribes included will be Athapascan, Eskimauan, Koluschan, and Skittagetan. Among the two first named, twined and coiled work, in many styles of weaving, will be found, while the two last named and their northern neighbours, the Aleuts, have avoided coiled basketry altogether. In Plate 136 are gathered types of the peninsula of Alaska—Athapascan, Eskimo, and Aleutian, embracing hard coil, soft coil, closed twined work, open twined work, straight warp, crossed warp, and hemstitch, gathered by E. W. Nelson.

In studying the basketry of this region, the following division, according to tribes and families, will be found convenient:

1. Athapascan (interior of Alaska).
2. Eskimo (around shore).
3. Aleuts (Aleutian Archipelago).
4. Tlinkits (southeastern Alaska).
5. Haidas (Queen Charlotte Islands).

Athapascan Coiled Basketry

Perhaps no other family of American tribes has such a variety of contacts with neighbours of different linguistic families and of limitations in environments having little likeness to one another. This northern branch of them, as

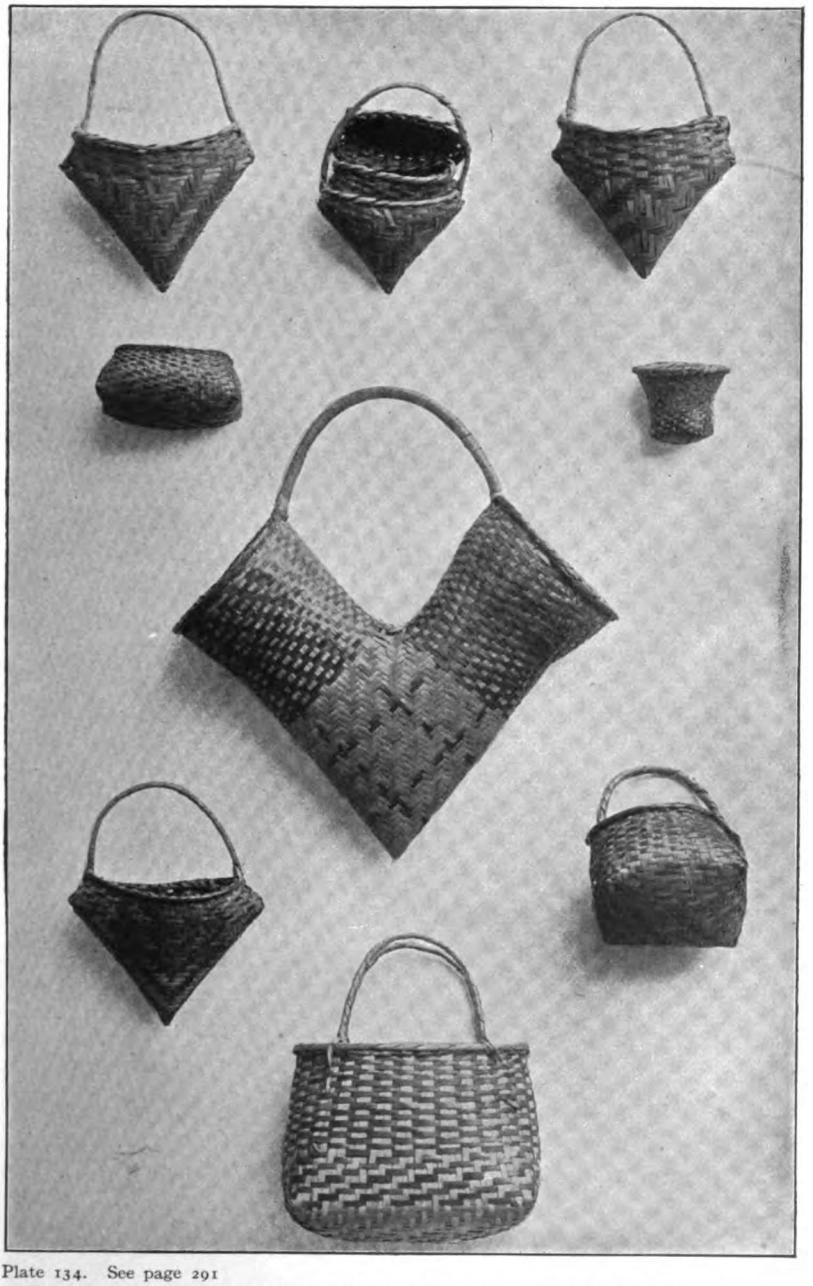


Plate 134. See page 291

TWILLED BASKETS OF SPLIT CANE, MADE BY CHOCTAW INDIANS OF LOUISIANA

Collection of Mrs. Carolyn G. Benjamin

will be seen in Father Morice's list,* is in touch along their southern border with Algonquian descendants of Mound Builders on the Ohio, with birch bark workers in northern middle Canada, and with Pacific coast tribes here and there. Some of these were noted in speaking of Region 1, page 279. Further on, other contacts will be shown. The distribution of the family is given by Powell on his linguistic map of North America.†

Here the Athapascans are in touch with Eskimo; indeed, most of the specimens of their ware shown were procured from the former in trade. Their technical methods will be best understood through illustrations.

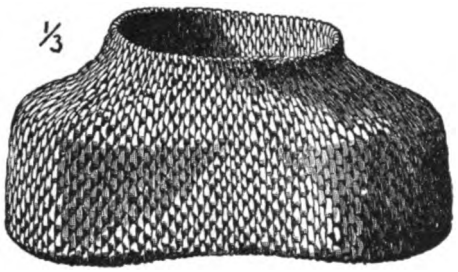


FIG. 127.
COILED WORK-BASKET.
Tinné Indians, Alaska.
Cat. No. 89,801, U.S.N.M. Collected by P. H. Ray.

The northern Tinné practice several varieties of technic in their coiled work. The tribes of the interior of Alaska make a very coarse coiled basket, now becoming common. Some of the very old pieces have the button-hole stitch in the sewing. In a collection of them, no two will agree either in shape or composition.

The best of the ware is from near the Mackenzie mouth, where dyed feathers are used for decoration. Some of the oldest specimens in the National Museum, entered in the first catalogue, are coiled basket trays of the Athapascan Indian tribes living at Fort Simpson, at the mouth of the Mackenzie River. Splints of willow and spruce root are employed in the work, and the ornamentation is meager, consisting of stripes on the side, and borders, in quilled work

* Transactions of the Canadian Institute, Toronto, IV, 1894, Pt. I, No. 7

† Seventh Annual Report of the Bureau of Ethnology, Washington, 1891, p. 55.

dyed in different colours. These specimens vary from 6 to 8 inches in diameter, and were gathered by R. MacFarlane, B. R. Ross, and W. L. Hardesty.

Fig. 127 is a coiled basket jar, of the Tinné Indians, near Point Barrow, Alaska. The specimen belongs to the single-rod type, in which one rod, or stem, constitutes the foundation. The sewing is done with split stems of willow, passing over the rod in progress and under the one forming the coil underneath. The illustration here given of this specimen is from Murdoch's paper on the Point Barrow Eskimo.* It is said to have come from Sidaru. The owner declared that it came from the Great River in the south, which Mr. Murdoch interprets to mean the Kowak, flowing into Hotham Inlet. The Eskimo are in the habit of going to this place in order to trade with the Indians, and thus this coiled basket found its way into the possession of the Eskimo at Point Barrow. This figure is 336, on page 326, in Murdoch's paper. Catalogue No. 89,801. Height, about 3 5–16 inches. Collected by P. H. Ray, United States Army.

FIG. 128.
COILED WORK-BASKET.
Tinné Indians.
Collected by P. H. Ray.

Catalogue No. 89,802, in the United States National Museum, is a conical work-basket, with a sealskin top, for a drawing-string, to keep the contents from falling out. It is in coiled weaving over a single rod, from Sidaru, northern Alaska, near Point Barrow, collected by Lieutenant P. H. Ray, United States Army. It is similar in technic to No. 89,801. Its height is 4½ inches, and it has been described by Murdoch. (See fig. 128.)

* Ninth Annual Report of the Bureau of American Ethnology, 1892, pp. 326–327.

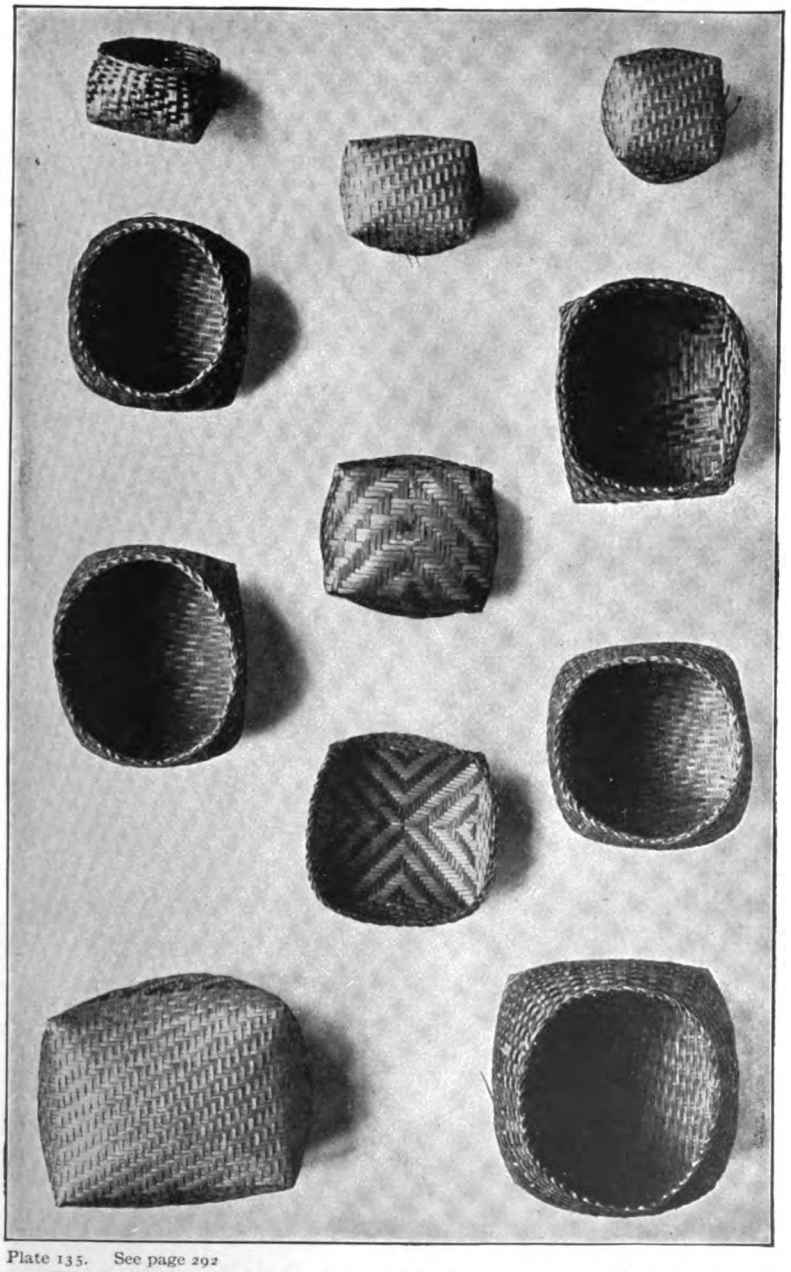


Plate 135. See page 292

TWILLED BASKETS OF CANE, MADE BY ATTAKAPAS, LOUISIANA

Collection of Mrs. William P. Johnston

Catalogue No. 56,564, in the United States National Museum, is an Eskimo woman's work box (Aguma, ama, ipiaru) in coiled basketry, from Point Barrow, Alaska, also collected by Lieutenant Ray. The material is willow and the technic is coiled work of the single-rod type. The neck of the basket is of black, tanned sealskin, and is tied with a string of the same material. Height 1¾ inches. It has been described by Murdoch. (See fig. 129.)

Take an example from another part of Alaska. Fig. 130 is a coiled basket of the Tinné Indians, who are settled on the Lower Yukon River. The foundation is a single rod of spruceroot, and the sewing is done with splints of the same material. It belongs to the type of coiled work called a single rod (see page 92); the stitches interlock with those underneath and inclose also the rod of that coil. Each stitch, therefore, really incloses two foundations. In the explorations of Dall, Nelson, and Turner, in this long stretch of river bottom, were collected many specimens showing transition between Indian and Eskimo activities.

FIG. 129.
COILED WORK-BASKET.
Tinné Indians.
Collected by P. H. Ray.

On the bottom, the basketmaker has taken the greatest pains to split the stitches of each coil with those of the coil beyond, giving to each one, looked at from the center, a bifurcated appearance which is quite ornamental. The same technic will be observed further on in examining the workmanship of the Thompson River Indians, in British Columbia, and by their neighbours, the Chilcotin. The Eskimo woman also in making her coiled basketwork splits the stitches of her coil and sews through them. This process is kept up on the body of this specimen half the way up.

The coils vary considerably in width; the stitches also are not of the same size, so that there is by no means the uniform regularity, either horizontally or vertically, that one observes in the California area. It will be noticed, too, that the top of each stitch is narrowed by reason of the crowding. Over the entire surface of this specimen it is quite impossible to see the foundation rod, because of this crowding of stitches.

This specimen is jar-shaped, and under good conditions

FIG. 130.
COILED WORK-BASKET.
Tinné Indians.
Cat. No. 24,342, U.S.N.M. Collected by Lucien Turner.

would hold water. Catalogue No. 24,342, in the United States National Museum. Collected, with many others, on the Lower Yukon River, by Lucien M. Turner. Diameter, 8½ inches; height, 6¾ inches. The manner of laying the splint foundation, of splitting the stitches, and of finishing off the border in false braid is shown in fig. 131, taken from another example.

It is a long way from middle Alaska to the Hupa Valley,

northern California. The basket here shown is No, 126,520, in the United States National Museum, collected by Captain Ray.* It is introduced to show a coincidence in form between the work of Tinné and Hupa, who speak languages of the same family in regions wide apart. It is twined work. (See fig. 132, and compare figs. 128 and 129.)

Eskimo Basketry

Baskets not only have an infinite variety of functions from village to village, but among each people they have a multitude of uses. From the shore of Norton Sound to the Kuskokwim the women are expert in weaving grass mats, baskets, and bags. Grass mats are used on the sleeping benches and for wrapping around bedding. They are used also as sails for umiaks. They now frequently serve as curtains to partition off the corners of a room or sleeping platform. Small mats are placed also in the manholes of kaiaks as cushions. The bags are used for storing fish, berries, and other food supplies, or for clothing. Smaller bags and baskets are made for containing small articles used in the house.†

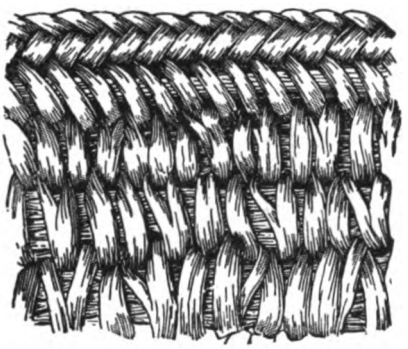


Fig. 131.
DETAIL OF COILED BASKET WITH SPLINT FOUNDATION, SPLIT STITCHES, AND BRAIDED BORDER.

Two types of basketwork are found in close proximity among the Eskimo in the neighbourhood of Norton Sound and Bristol Bay, north and south, the twined and the coiled. In the former (fig. 133) the treatment is precisely the same as in those of Aleutian Islands, to be described, but the Eskimo

* Smithsonian Report, 1886, Pt. I, pl. XV, fig. 67.

† E. W. Nelson, Eighteenth Annual Report of the Bureau of Ethnology, 1900, pl. 74.

wallet is of coarser material and the weaving is far more rudely done. Quite as interesting as the wallets is the matting. (See Plate 136.)

At Chuwuk, on the Lower Yukon, Nelson saw a woman making one of these mats, and watched the process she employed. A set of three or four straws was twisted and the ends turned in, for a strand, a number of which were arranged side by side with their ends fastened along a stick, the primal loom, forming one end of the mat and hanging down for the

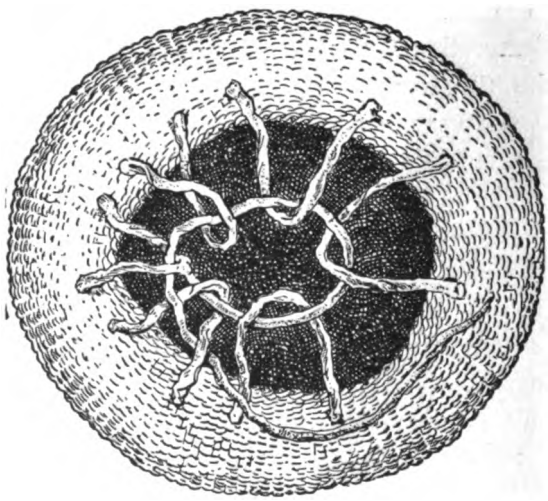


FIG. 132.
TOBACCO BASKET.
Hupa Indians, California.
Collected by P. H. Ray.

warp. Other strands were then used as woof. By a deft twist of the fingers, it was carried from one side of the mat to the other, passing above and below a strand of the warp; then the woof strands were twined around the other strands of the warp, to repeat the operation. The woof strands were made continuous by adding straws as necessary, and with each motion the strands were twisted a little so as to keep them firmly together. By this simple method a variety of patterns is produced.

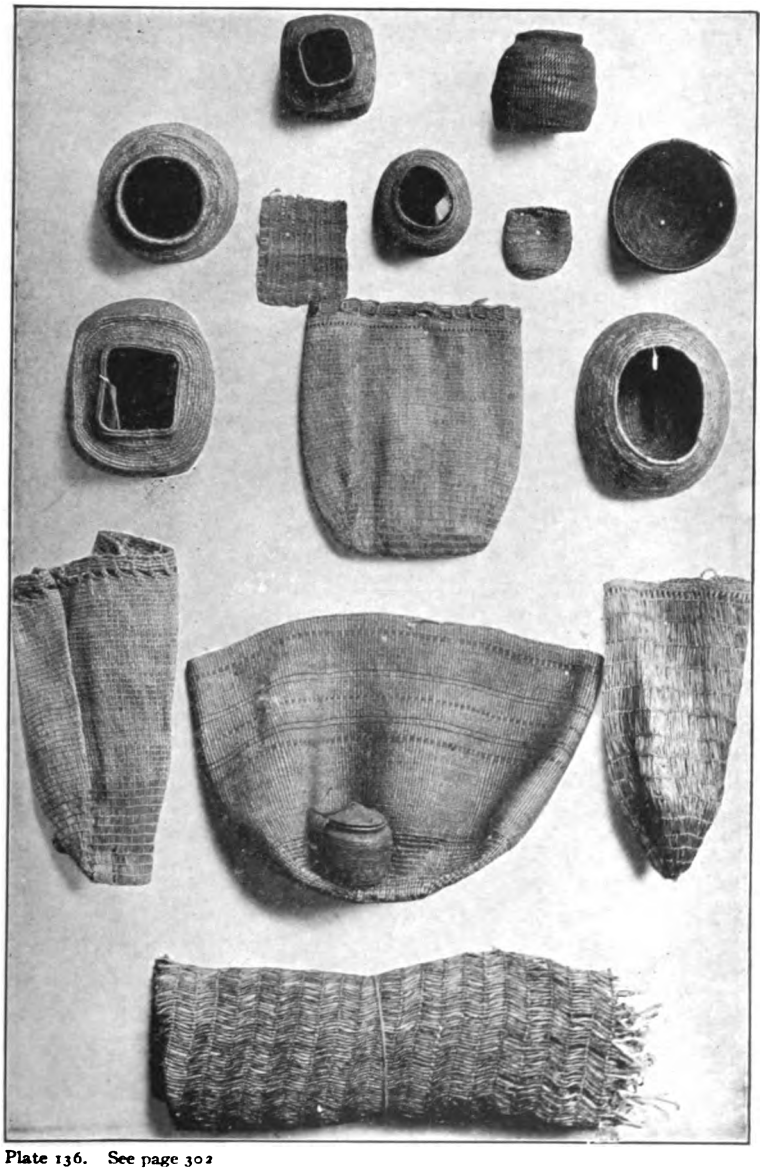
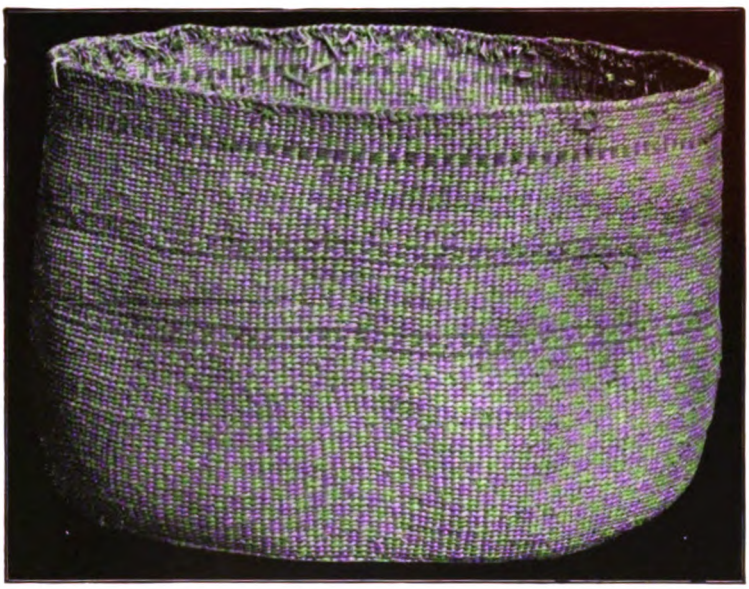


Plate 136. See page 302

TYPES OF TWINED AND COILED BASKETWORK IN ALASKA
AFTER E. W. NELSON



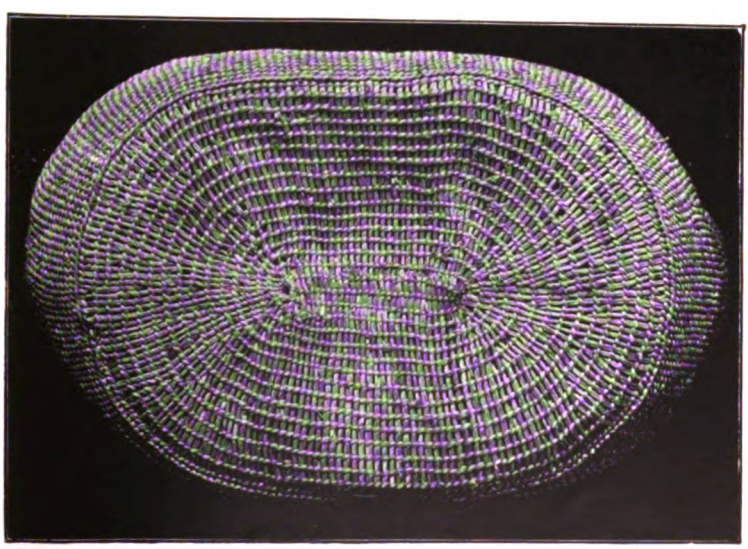


Plate 137. See page 303

TWINED WALLET IN OPENWORK, ESKIMO OF NORTON SOUND, ALASKA

Collections of U. S. National Museum

Grass bags are started from the bottom where the strands of the warp, consisting of two or more grass stems, are fastened together and extend vertically downward. The woof is formed by a pair of strands of grass, each of which is twisted about itself and both twined with the strands of the warp inclosed in the turns; both are continually twisted as the weaving progresses. In coarsely made bags the strands of the woof are spaced from an inch to two inches apart, and those of the warp at intervals of from a quarter to half an inch. These bags have a conical bottom, which slopes from the center to the sides. At the mouth the ends of the warp are braided to form a continuous edge.*

FIG. 133.
DETAIL OF ESKIMO TWINED WALLET.
Collected by E. W. Nelson.

The lower figures in Nelson's group of Alaskan basketry (Plate 136) show plainly the matting, the closely woven twined wallet, and the openwork. Plates 137 to 145 in this paper are all excellent illustrations of the ware here described. The specimens are in the United States National Museum.

Plate 137 will show better the detail, body and bottom, of one of the twined wallets of the Norton Sound Eskimo. The warp and the twining of the bottom are of a very coarse, rush-like grass. The bottom is in openwork, and oval. In this example the warp is radiating from a median line; in others the strands are laid parallel, so that they form a rectangle. At the boundary line between the bottom and the body of the wallet there is a row of three-strand weaving, the

* Eighteenth Report of the Bureau of Ethnology, 1900, pl. LXXIV.

rows running in opposite directions, as will be seen in the drawing. The body is rush colour; the spotted lines on the cylindrical portion are in black, produced by the insertion of rags and bits of hide. This effect may be varied by mixing two strands of different colour in the twine. The fastening off at the top is done by working the warp strands into a three-strand braid, turning down on the inside of the vessel, and cutting off an end whenever a new warp thread is taken up by the braid. Frequently the last three or four warp straws are not cut off, but braided out to their extremities in order to form a handle for the basket.

In order to show how the warp and weft are administered in this far north region, a square inch of a wallet is represented much enlarged, fig 133. The openwork, producing parallel figures, is effected by leaving spaces between the different lines of twining. The four rows at the top of the drawing are plain, solid, twined weaving; the fifth row from the top is twined in an opposite direction, giving the effect of a three-strand braid between the two rows. It is interesting to find this method of basket-weaving so far north.

The student will notice further on that very much of the elegant use of the warp in ornamentation, so common with the Aleuts, who speak a kindred language and live near-by, is lost. It will be seen, however, that with their rude materials and tools the Eskimo have acquired the art of making a great variety of basketry, showing that they have had a multitude of teachers. This specimen, Catalogue No. 38,872, in the United States National Museum, was collected, with many others, at Norton Sound, by E. W. Nelson.

To furnish a means of comparison between the two sides of Bering Sea, Plate 138 is a twined wallet of the Chukchi people of Kamchatka. The foundation is of straw laid parallel, and the weft is of plain twined weaving, the rows one-half an inch apart. The border is finished off by gathering the ends of the warp into a braid. The decoration on this

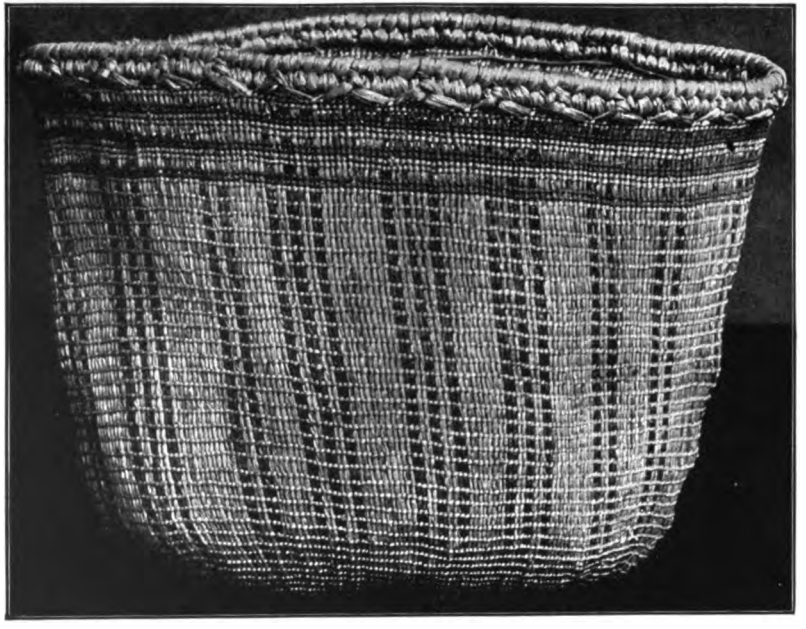


Plate 138. See page 304

TWINED WALLET IN OPENWORK, CHUKCHIS, NORTHEASTERN ASIA

Collections of Am. Mus. of Nat. Hist., N. Y.

Plate 139. See page 305

CLOSELY TWINED WALLET FROM KAMCHATKA TO COMPARE WITH ESKIMO WORK

Collections of Am. Mus. of Nat. Hist., N. Y.

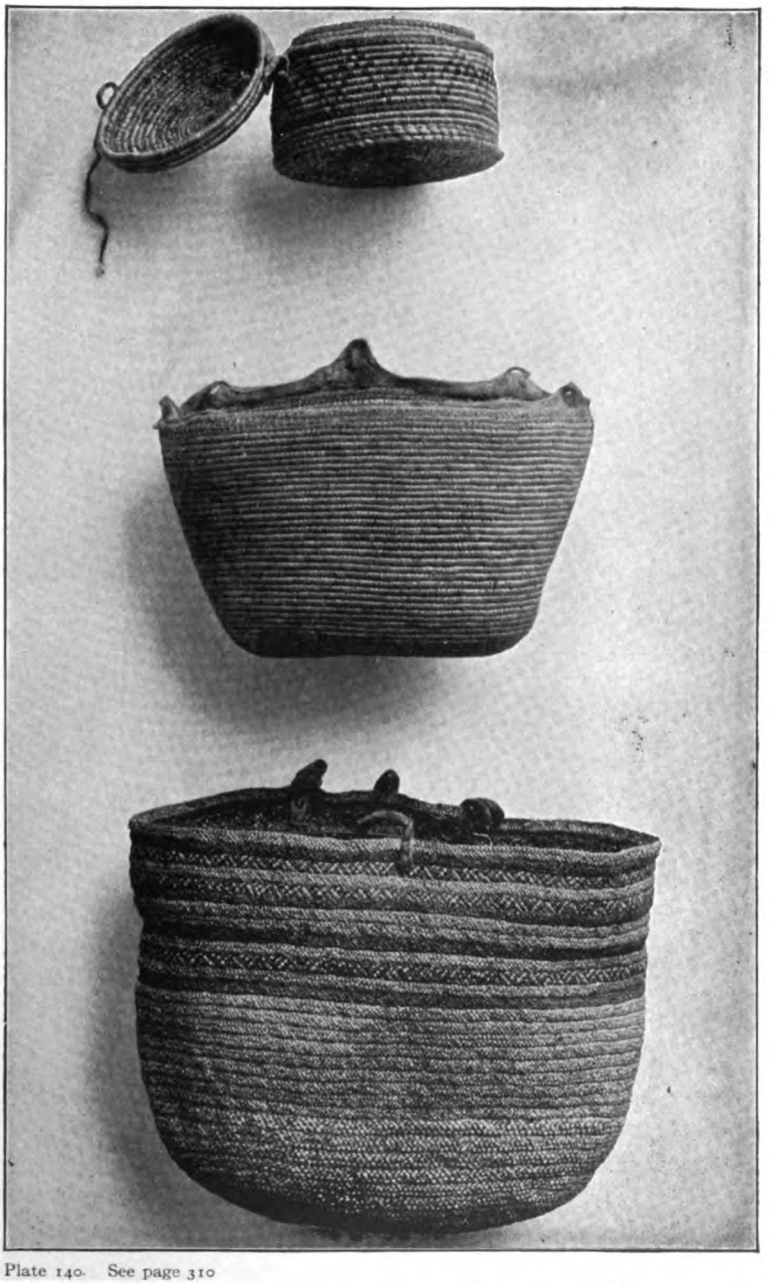


Plate 140. See page 310

COILED BASKETWORK OF CHUKCHIS AND KORYAKS OF KAMCHATKA

Collections of Am. Mus. of Nat. Hist., N. Y.

basket is effected first by colouring warp strands black and grouping them systematically, and also by three narrow bands of black twined weaving near the top. Its height is 12 inches. This specimen, now in the American Museum of Natural History, New York, was collected by the Jesup Expedition.

To pursue the comparison farther into Asiatic territory, Plate 139 is a wallet in twined weaving from Kamchatka, introduced here for comparison with the Chukchi type, just shown. The warp is of coarse hemp cord; the weft or filling is of grass stems in natural colour dyed black. The bottom is ornamented with bands in two colours; in each band there are alternate rows of black and white stitches arranged perpendicularly; in the next band they are oblique, and in the next perpendicular, forming an interminable mass of changing patterns, having a very pleasing effect. The body is covered with alternations of plain and variegated bands in which the white and black are administered in triangles, rectangles, chevrons, and zigzag patterns. The work on this wallet is finely done. The effect of the ornamentation is very attractive—on the top the ends of the warp are bent down and held in place by loops of sinew thread. The work nearest like this will be found quite common on the eastern side of Bering Sea and on the Pacific coast of America. The writer is indebted to Doctor Franz Boas for drawing attention to these similarities.

Its height is 13 inches. This specimen, now in the American Museum of Natural History, New York, was collected by the Jesup Expedition.

The coiled variety of Eskimo basketry, previously mentioned, consists of a bunch of grass sewed in a continuous coil by a whip stitch over the bunch and under a few stems in the coil just beneath, the stitch looping under one of the lower coil. When this kind of work is carefully done, as among the Indians of New Mexico, Arizona, and California,

and in some exquisite examples in bamboo from Siam and in palm leaf from Nubia, beautiful results are reached; but the Eskimo basketmaker does not prepare her foundations evenly, sews carelessly, passing the thread sometimes through the stitches just below and sometimes between them, and does not work her stitches home (fig. 51). It can not be said that she

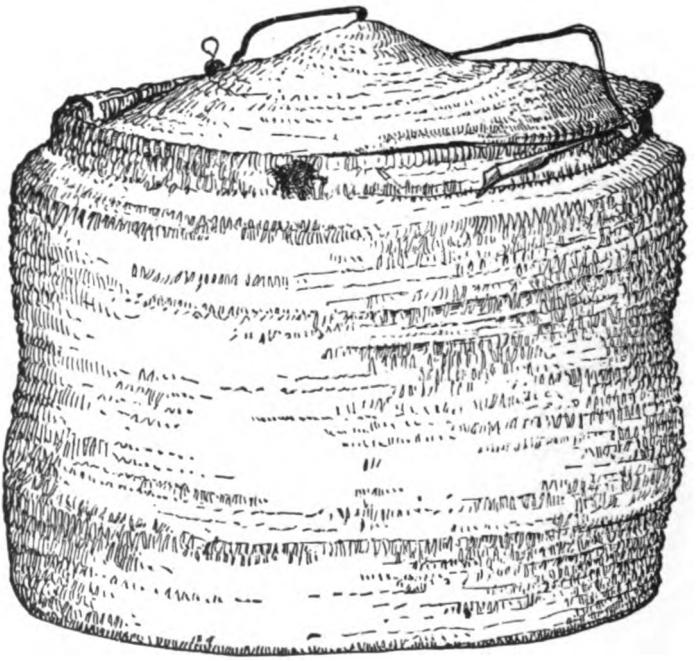


FIG. 134.
COILED BASKET.
Eskimo Indians, Alaska.
Cat. No. 38,469, U.S.N.M. Collected by E. W. Nelson.

has no skill with the needle, for her embroideries in fur, intestines, and quill are excellent. Most of the coiled baskets in the Eskimo collection in the National Museum were gathered by E. W. Nelson, and have a round bit of leather in the bottom to start upon (fig. 135). The shape is either that of the uncovered bandbox or of the ginger jar.* Especial attention should be paid to this form of stitching, as it occurs again in

* Eighteenth Annual Report of the Bureau of Ethnology, 1900, pl. 74.

widely separated regions in a great variety of material and with modifications producing striking effects. (See figs. 134, 135.)

The Eskimo women employ in basket-making a needle made of a bird bone, ground to a point on a stone (fig. 40). Fine tufts of reindeer hair taken from between the hoofs are modernly used in ornamentation, just as the California

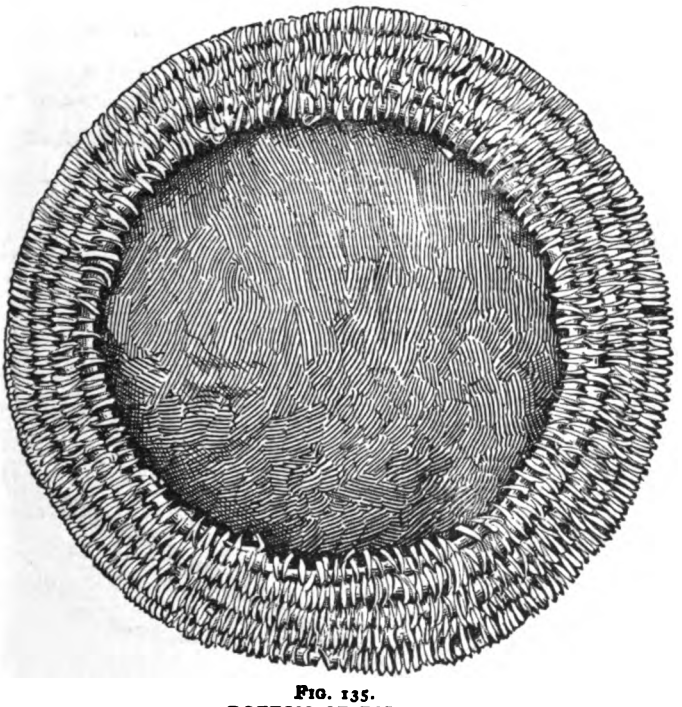


FIG. 135.
BOTTOM OF FIG. 134.

women catch the stems of feathers under their stitches as they sew.

Figs. 135 and 136 will illustrate this rude type of coiled basketry of the Eskimo about Norton Sound. It is quite certain that the art of basket-making is not an old one with these people. They have not learned how to begin the work from the center of the foundation, and always leave a circular space, either vacant or to be filled with some other substance.

In the example here shown, a piece of hide 4 inches in diameter and irregular in outline constitutes the starting-point. Holes are punched around the edge of this, as shown in the detail drawing (fig. 136), and the foundation of grass stems and leaves is sewed immediately to this with strips of the same material, not with any regularity or neatness. The basket has a cover, which is also interesting in its leather hinges, fastening, and handle. It must be admitted, however, that under the stimulus and demands of trade, the art is improving. Specimens are at this date brought home that are vastly better made than any of the old pieces in the National Museum; charming cloud effects are produced in sewing by using straws of different tints.

FIG. 136.
DETAIL OF ESKIMO COILED BASKET.

This specimen, Catalogue No. 38,469, in the United States National Museum, was collected by E. W. Nelson.

Catalogue No. 127,891, in the United States National Museum, is a small jar-shaped coiled basket from the Kowak River region, north of Bering Strait, Alaska, collected by Lieutenant George M. Stoney, United States Navy. The foundation of the coil is a small number of slender grass stems. The sewing is in material of the same kind. The special characteristic of this specimen is that, in the sewing, the grass filament is wrapped once around the foundation and on the next turn is locked in the stitch underneath. This is an economical method of working, but it weakens the basket. The work on this specimen is slovenly done. It has a small piece of leather in the center of the foundation. Height, $1\frac{3}{4}$ inches. This example is a waif. It comes from the Arctic Ocean area, and most of the pieces in the museum from near-by are Tinné and gotten by the Eskimo in trade. More

curious still is the extra wrap about the foundation every time a stitch is taken. The raffia coiled baskets made in some of the schools are similar.

Catalogue No. 35,962, United States National Museum, is a basket jar of the Eskimo, at Kushunuk, Alaska. The flat bottom is in open twined weaving of grass stems. The sides are in coiled work of the same material, the outline being rectangular, with rounded corners. The notable feature of this piece is the union of two fundamentally different methods of manufacture, the twined and the coiled.

Its height is 4 11–16 inches, and it was collected by E. W. Nelson.

Catalogue No. 36,190, United States National Museum, is a coiled basket jar of the Eskimo on the Lower Yukon. The bottom is a piece of sealskin three inches in diameter. The coiled work on this specimen is unique. A grass foundation is held together by half-hitches, or button-hole stitches, in the same material, close together. There are sixteen rows. The stitches pass over the foundation, lock with the stitches underneath, and in returning make a turn about the standing part. The technic is not half-hitch, but, if the foundation were pulled out, would resemble the twisted coils in the Mackenzie River game bags, muskemoots (Plate 129), or the work on the textile from Hopewell mound, Ohio. (See fig. 116.)

Catalogue No. 153,686 in the National Museum is a coiled basket jar of the tribes on the lower Yukon, Alaska. The foundation is a flat piece of hard wood, varying in width, overlaid by a small splint, which gives an uneven line on the outside. The sewing is done with strips of willow rods without bark. The stitches pass over both strips of the foundation and are caught between the two strips of the foundation coil underneath. This is the only specimen of its kind in the museum from Alaska. The use of a broad foundation gives a flat appearance to the surface, something like that of the Mescalero basketry in New Mexico. A handle is attached,

the technic being the same as that of the basket. Height, about $4\frac{3}{8}$ inches. Collected by J. Henry Turner.

Catalogue No. 127,482, in the National Museum, is a coiled basket jar of the Eskimo, Togiak River, emptying into Bristol Bay, Alaska. The foundation is a piece of sealskin. The rows of the basket are built up by coiled work, with straw for foundation and sewing. The peculiar characteristic * is the neat and regular manner in which the stitches, in passing outward, split the underlying stitch of the previous coil. On the surface these stitches pass from top to bottom in regular vertical lines, resembling feather stitch. The upper margin is ornamented with a row of birds' feet. Its height is $2\frac{7}{8}$ inches, and the specimen was collected by I. Applegate.

Catalogue No. 127,483, United States National Museum, is a coiled basket jar of the Eskimo on Togiak River. A rude ornamentation is attempted on the surface near the top by overlaying the foundation with a band of brown material underneath the stitches. Much will be said about this device of overlaying among Indian tribes farther south.

Its height is 2 inches, and it was collected by Mr. Applegate.

The upper figure in Plate 140 is a covered basket in coiled work of the Chukchi people of Kamchatka. Foundation, a piece of sealskin; bottom, coarse coiled work in straw, held together by sewing in sinew thread, the stitches being one-half inch apart. The body is built up of coiled sewing, similar to that of the Eskimo of Alaska. Decoration, bands of chevron pattern in black. Hinge and fastening of sealskin. Top decorated with six-pointed star. Diameter, 7 inches.

This specimen, now in the American Museum of Natural History, New York, was collected by the Jesup expedition. The students of culture will be interested in the results of this exploration, which settle the question of unity of industries in the two continents.

* See Report United States National Museum, 1884, pl. IV, showing furcated stitches.

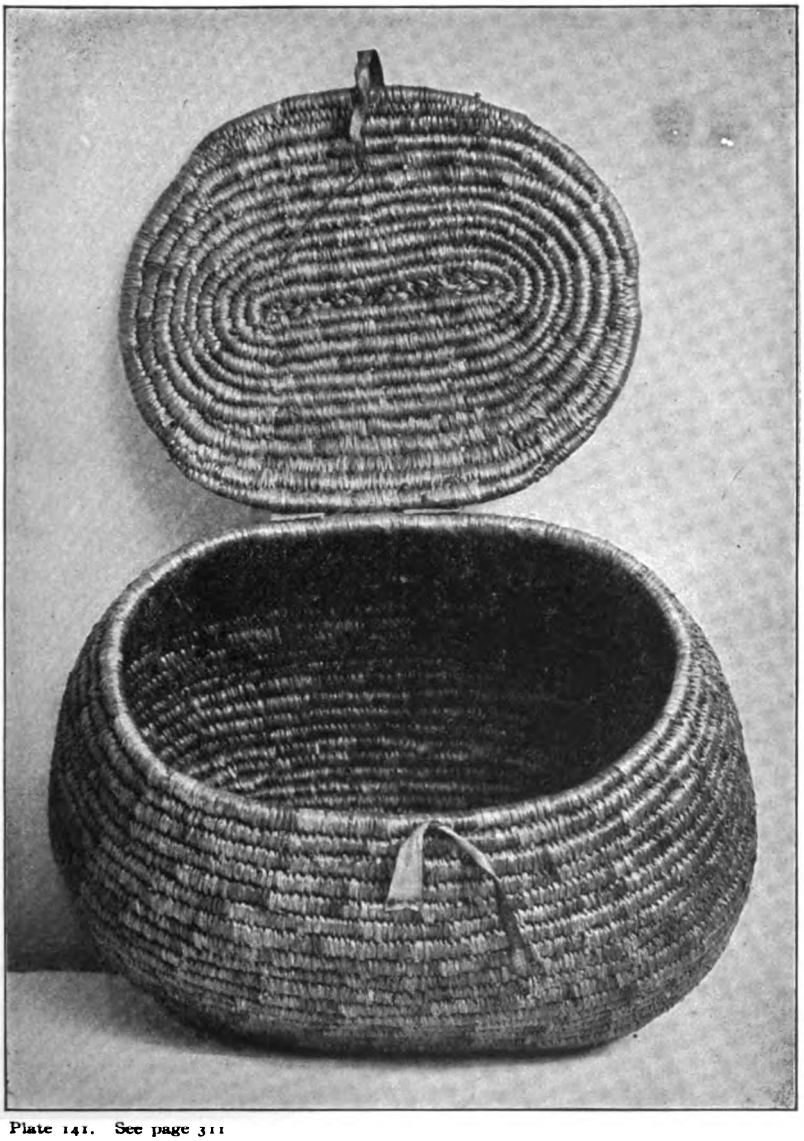


Plate 141. See page 311

ESKIMO BASKET, SHOWING INTERLOCKING COILED WORK, FROM THE LOWER YUKON, ALASKA

Fred Harvey Collection

Fig. 2, on Plate 140, is an oblong coiled basket of the Chukchi people of Kamchatka. In the foundation, as in the Eskimo baskets, an oblong piece of sealskin is inserted. The people of the north region do not seem to know how to make the coil beginning which prevails among the Indian tribes.

Around this sealskin the bottom consists of a continuous coil of grass stems held together by wide, open coiled sewing in sinew thread. The body is built up on a grass foundation, with sewing in the same material, resembling precisely the work done by the Eskimo of Port Clarence. Three rows of coiled work at the top are like that at the bottom, and over all is a band of sealskin rawhide with holes here and there for carrying. Its height is 9 inches. This specimen, now in the American Museum of Natural History, New York, was collected by the Jesup expedition.

The bottom figure on Plate 140 is a braided and coiled wallet of the Koryak people of Kamchatka. The foundation is a strip of sealskin. The body is built up in a continuous coil of six-strand braid, as in making hats. The decoration consists of alternating plain with coloured rows of braid. Loops of sealskin on the top serve for fastening and carrying. This is a rare type of basketry in America. Its height is 13 inches.

There is a small specimen in the United States National Museum, obtained by Captain John Rodgers, United States Navy, in 1852–55, made in the same way. As his expedition was on the Arctic coast of Asia, this piece also may have come home from that quarter.

Plate 141 is a covered coiled basket in the collection of Fred Harvey. It is from the Lower Yukon River country and represents one of the best types of Eskimo work. Especial attention is called to the evenness of the stitches, which interlock and at intervals gather in a few of the straws of the foundation. The mottled surface of the basket should also be noted in connection with the delightful effects produced

by simply managing the natural colours of the straw with which the sewing is done. Attention has been directed to the glorification of this technical method by the Mission Indians in California. This specimen represents the very best coiled work that the Eskimo can make.

Aleutian Basketry

In 1874, William H. Dall contributed to the United States National Museum several specimens of twined basketry, from Attu and other islands far out in the Aleutian chain. (Catalogue Nos. 19,476–19,480.) There for the first time this exquisite weaving was brought to light. Warp and weft are straws of beach-grass,* and the workmanship will compare favourably with that of any other basketmakers in the world. In the conical wallets, which resemble in outline those of the Eskimo and southeastern Alaskan tribes, the warp straws radiate from the center of the bottom. On the body the twined weft, always the same plain two-strand work, is applied to the warp, so as to give rise to several technical varieties, which may be classified as follows:

1. Plain twined weaving, the weft driven home (Plate 142).

2. Open twined work, there being open spaces between the rows of weaving, but the warp strands are parallel.

3. Crossed warp, in which there are two sets of warp elements, one half inclining to the right, the other half toward the left. The twined weaving binds the decussations, making hexagonal meshes. This type has an interesting distribution on both sides of the Pacific.

4. Divided warp. A pretty effect is produced by these Aleut basketmakers, who split the warp, or divide it, if it consists of straws in pairs, and twine the weft straws around

* *Elymus mollis*, Sitka, Norton Sound, Kotzebue Sound; *Elymus arenarius*, Norton Sound to Point Barrow; *Elymus sibiricus*, Sitka. Rothrock, Smithsonian Report, 1867. For a description of the Eskimo and Aleuts, see W. H. Dall, in the Contributions to North American Ethnology, I, 1877, pp. 7–106.

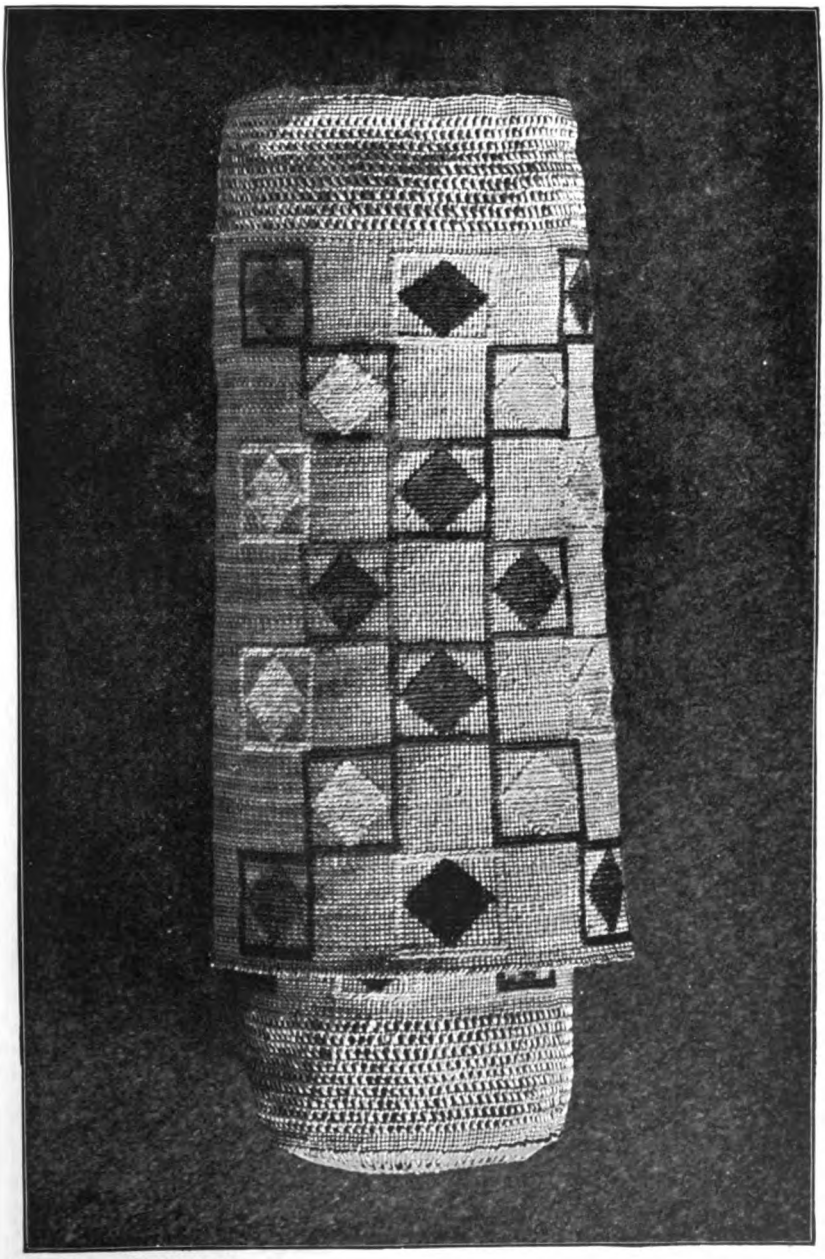
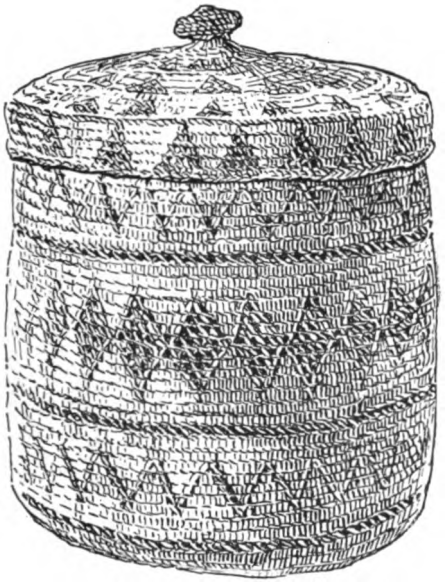


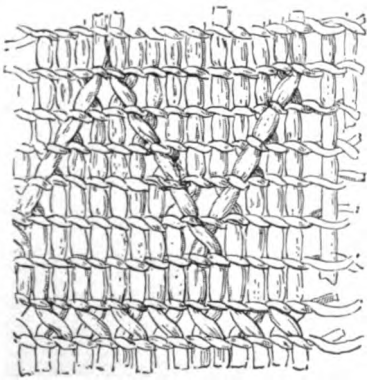
Plate 142. See page 312

TWINED WEAVING IN CLOSE AND IN OPENWORK TWINED WEAVING

ALEUTIAN ISLANDS

Collections of U. S. National Museum





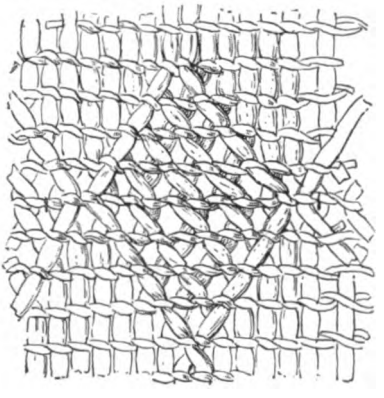


Plate 143. See page 313

DETAIL OF CROSSING WARP STRANDS IN ALEUT BASKET

Collections of U. S. National Museum

two halves of the same straw and next around two half-straws not of the same, but of adjoining stalks. If the warp be of straws by twos, the left-side member of one pair is entwined with the right-hand member of the adjoining pair. On the next round there is an alternation, the straws that belong together being entwined. The result of this is a series of lozenge-shaped openings, or meshes (figs. 16, 17). The general appearance of the surface resembles a form of needle-work called hemstitching. The Aleuts in doubling the warp do not place one element behind another as do the Tlinkits, but alongside. This enables the weaver to convert her technic into some other type in the successive rounds. She may have plain twining, crossed warp, zigzag warp, or hem-stitch at any moment.

5. Diverted warp. By this is meant a form of weaving in which certain warp straws are deflected from the perpendicular for a few courses and then brought back or changed to the upright position again. The result of this is a most pleasing effect (Plate 143) and of the greatest variety on the surface. Attention has been previously invited to the similarity of Mound Builders' work in the Mississippi Valley to the playing with the warp of which the Aleuts were so fond. Away down among the mummies of Peru are found relics of weaving of precisely the same sort.

Ornamentation is produced by what looks like darning or whipping one or more rows of coloured grass after the body is formed. It is in effect the false embroidery of the Tlinkits farther south. The worsted patterns are woven into the texture and do not show at all on the inside. (See fig. 16.) Another plan of attaching the ornamentation is very ingenious, but not uncommon. Two strands of coloured straw are twined, and at every turn one of the strands is hooked under a twist on the body of the basket by a kind of "aresene" work or false embroidery with twine. The ornament has a bold relief effect on the outside and is not seen at all on the inside.

The making of the beautiful twined ware is not new in these small islands. Lisiansky * affirms that the Aleuts make baskets called "ishcats," in which they keep all their valuables.

To begin with the eastern tribes, Catalogue No. 2,192, in the United States National Museum, is a twined wallet of the Aleuts (Eskimauan family) on Kadiak Island, Alaska. Native name, Enakhtak. It is made entirely of Topkhnaluk, or wild rye (*Elymus*). The lower stalks are chosen because they have become yellow through want of light. The wallets are woven from the standing grass, generally in July and August, by the women, while engaged in curing salmon. In order to secure uniformity in texture, the broader leaves are split. An ordinary knife is used to cut the grass, but no other apparatus than nimble fingers has to do with the manufacture. The twining is called agankhak. The Kadiak baskets are used chiefly in gathering berries and also in straining a kind of wine made from them. This specimen was collected by Lieutenant G. T. Emmons, United States Navy.

These wallet baskets are woven without ornamentation, except, maybe, a line or so near the mouth, often effected by introducing one or more rows of black rags, the warp strands forming a heavy plaited rope-like border, which permits carriage by means of cords through the openings. In the Kadiak wallets, the Tlinkit border is also imitated where the warp ends are bent down and held by twined weaving.

Catalogue No. 14,978 in the United States National Museum is a typical old Aleut wallet. The cylindrical part is covered with meshes in diamond pattern, shown in fig. 9, Plate 136. The ornamentation on the surface is produced by false embroidery with strands of red, blue, and black worsted. The continuous line between the open stripes is formed by false whipping with a single thread of worsted on the outer stitches of one of the twines of straw. The border is a complicated braid.

* Voyage Round the World, 1803–1806, London, 1814, p. 181.

A square inch of this weave, enlarged (see fig. 17), taken from the part of the texture where the rectangular meshes pass into the lozenge-shaped, will show the peculiar method of separating the warp threads and working the halves alternately to the right and to the left.* In the bottom row the pairs of warp straws are perpendicular and gathered into the twined weaving, so as to produce rectangular spaces. All the rows above this are in the pattern here described. From the Attu Island; collected by William H. Dall.

Plate 142 shows the fine close-twined work done on the extreme western islands of the Aleutian chain. The specimen here described is Catalogue No. 204,588, United States National Museum, the gift of Mrs. Mary L. D. Putnam, of Davenport, Iowa. Its noteworthy features are the crossed warp and the patterns worked in coloured worsted on the surface. The material is beach-grass—some species of *Elymus*. The false embroidery on the surface, there can be no doubt, is borrowed in its method from the Tlinkit Indians of southeastern Alaska. Among the old Aleut wallets, of which there are many in the National Museum, the weaving does not begin to be so fine as on this later ware. It is the same story of progress. With the possession of better knowledge, of superior tools, of gauges for sizing the straws, and, above all, of such demands for their products as to stimulate emulation to its highest pitch, the Atka and Attu weavers have reached their climax.

Plate 143 is introduced to show the technic of variety No. 5, diverted warp, combined with variety No. 2, or openwork. Fig. 1 illustrates the general effect of this combination. Attention has been called before to the enigmas awakened by the great variety and exquisite taste of these people, our first possession in the Eastern Hemisphere. In figs. *b* and *c* the detail will be better understood. In fig. *b* the first has parallel warp. In the next row each pair of continuous warp straws are crossed. In the third row they proceed vertically,

* See Report of the United States National Museum, 1884, pl. I, Fig. *b*.

and so do most of them in the fourth row; but here and there they are crossed again back to the position they occupied in the second row. These, too, continue in the oblique direction in the fifth, sixth, seventh, and eighth rows, crossed in each with a straw of that particular row. In the upper course they return to the vertical position. The twined weaving is precisely the same in every case. It does not vary, whether in the closed or open weaving. No artistic effect is expected therefrom. In this plate, where the decorative form is started in the bottom row and begins to widen out, all of the intersections within the parallelograms are crossed. At the tenth row, above the upper border of the drawing, the straws return to their vertical position immediately over the starting-point. These two are only specimens of the innumerable ways of producing effects in Aleutian baskets by changes in the warp.

It will add to the interest in the Attu weaver to see her at her work. Plate 144, taken by Engineer C. Gadsden Porcher, of the United States Revenue Marine Service, shows her at the front door of her barabra, or underground hut. She is essentially a cave-dweller. The framework of the house may be drift-wood, wreckage, or timber deposited by ships. Over this, moss from the tundra is piled, and Nature plants her garden.

It is an error to attribute all of the Aleut basketry to the women of Attu. Porcher has worked out the types in the March number of the *Craftsman*,* describing minutely the grasses, the methods of curing them, and the different weaves of Attu, Atka, Umniak, and Unalashka.

The first thing that demands notice is that she is weaving upward—upside-down, a careless first thought would say. The bottom of her fine wallet is suspended from a pole, most primitive of warping-beams, stuck into the roof of the barabra. John Smith's Indians used a limb of a tree (figs. 147 and 148). The Bristol Bay Eskimo now employ a stick supported on forked

* *The Craftsman*, New York, March, 1904, pp. 575–583.

Plate 144. See page 316

ATTU WEAVER WORKING UPWARD ON SOFT WARP SUSPENDED

Photographed by C. Gadsden Porcher

stakes; so do the Chilkats for their highly prized blankets, and the tribes farther south to make cedar-bark garments. Indeed, the loom is about to be born. With a lens it will be seen that the basketmaker is doing the best work, in which every variety of Aleutian technic is engaged. Her costume shows her to be in the current of world-embracing commerce and thought. The plants about her and the precious work of her fingers, together with the ideas in her retentive mind, are survivals from the past.

Tlinkit Basketry

The basketwork of the Tlinkit Indians is superb. Everyone who sees it is struck with its delicacy of workmanship, shape, and ornamentation. Most of the specimens in the National Museum collection are of the bandbox shape, but they can be doubled up flat like a grocer's bag. (Plates 65 and 67.) The material of foundation and weft is the young and tough root of the spruce, split, and used either in the native colour or dyed brown or black. The structure belongs to the twined type before mentioned, and there is such uniformity and fineness in the warp and woof that a watertight vessel is produced with very thin walls. The warp is double, one splint resting on the other and outside of it. In size, the wallets vary from a diminutive trinket basket to a capacity of nearly a bushel. All sorts of designs in bands, crosses, rhombs, chevrons, triangles, and grecques are produced thus: First, the bottom is woven plain in the colour of the material. In a great many pieces a row of plain weaving alternates with the twined weaving for economy, in which case the woman carries along two rows of work simultaneously. Then, in the building up of the basket, bands of plain colour, red and black, are woven into the structure, having the same colour on both sides.* At the same time, little squares or

* See G. T. Emmons in the Memoirs of the American Museum of Natural History, New York, 1903. This paper is the result of twenty years' work among the Tlinkits by a patient observer, and should be studied with special care.

other plain figures made into designs are added in aresene, or what is here called false embroidery—that is, only half way through—giving the most varied effect on the outside, while the inside shows only the plain colours and the red and black bands. Wild rye straws (*Elymus*) for coarse work, and hair-grass (*Deschampsia*) on fine work are used in this second operation, in plain rich golden colour or dyed, being whipped over and over along the outer threads of the underlying woof. Other grasses for false embroidery are *Panicularia nervata*, *Calamagrostis langsdorffii*, *Cinna latifolia*, and *Bromus sitchensis*. (See Plate 145.)

For borders on Tlinkit and Haida ware see pages 115 to 122, figs. 73–81.

The Tlinkits recognise five styles of weave, not including the fish trap, the false embroidery in grasses and plant stems, and the plaited borders. These are all in twined weaving, the progress of the work being from left to right and the outer woof strand sloping downward. Lieutenant Emmons gives the native name of each as follows:

1. Plain close-twined weaving, Wush tookh á r-kee ("close together work"), which is perfectly water-tight, and is the standard weave of fully three-quarters of all baskets made. It consists of the simple twining of two woof strands around each successive thickness of warp splints. The regular weave produces the vertical, ridge-like appearance in the line of the warp, the polished exterior surface of the root forming the outside or ornamental face of the work.

An openwork work-basket in this plain twined weaving is known as Khart ("a strainer," literally, "will not hold water"). It is used in trying out fish oil and in cooking and straining berries.

2. Twined and checker weaving, Khark gheesút ("between," "in the middle of"), from the introduction of a single woof strand in checker or wicker weaving between the lines of the regular twined stitch. It gives a broken, irregular effect

Plate 145. See page 318

ALEUT MANUAL TRAINING SCHOOL, MRS. PHILASET TEACHING BASKET-WEAVING

Photographed by C. Gadsden Porcher

from the exposure of the warp along the line of the single weft, as well as from the dull, fibrous surface of both of the strands, which are of the coarsest inner sections of the root. This weave is of a later origin; the plain weaving has been borrowed from the mainland and from the more southern people. It is characteristic of the cedar-bark work from Frederick Sound to the Straits of Fuca. It is wanting on the oldest specimens of Yakutat baskets. Its use is confined to the coarser work, such as the plaque-like berry, sewing, and work-baskets of the woman, the bottoms of the baskets and the unexposed tops of the covered baskets. It is in great favour among the Chilkat, who make many large baskets. It is used for economy, both in the quantity and the quality of the material, as one woof strand is saved in every three, and in the more valued exterior root section the saving is one-half. But its disadvantages are loss of strength, rigidity, and closeness of texture, and it does not admit of the embroidery in grasses and plant stems which is the characteristic feature of Tlinkit basketry. (See figs. 140 and 141.)

3. Diagonal twined weaving, Hiktch hee há r-see (rough or uneven, like the skin of the frog's back, from its mottled character), is formed by the simple twining of two woof strands about pairs of warp elements. The weave separates the pairs in each superimposed line of woof, and breaks joints in the units of weave, just as in myriads of Attu and Ute baskets. (See Plates 96 and 143.) It is, in fact, the well-known twilled weaving. This weave was never extensively used among the Tlinkit, except as a skip stitch in conjunction with the ordinary twining (No. 1), whereby a number of geometric figures are produced which form the ornamentation of the Haida hat rim and the Chilkat basket border.

Shuck kuhk (strawberry basket) has erroneously been classed as a type of weave, but it is simply a variation of the regular twined weave, in which the woof strands are of different colours, so that in both the vertical and the horizontal lines

there is produced a variety of effects, supposed to resemble the seed-covered surface of the wild strawberry. This character of ornamentation is more commonly found in bands on the women's work-basket and on mats of basket covers. The flecking of the surface of twined ware with dark and light spots is not confined to the Tlinkit, but will be observed among all Western tribes that have this weave. (See Plate 67).

4. Crossed-warp twined weaving, Wark kus-ká rt ("eye holes," from the polygonal meshes of the openwork weave), in which the warp splints are drawn aside from the perpendicular at a fixed angle, the odd numbers trending one way and the even numbers the other. These cross each other successively in parallel series, just after which they are inclosed and held in place by the ordinary twining of two woof strands. The size of the meshes is regulated by the distance apart of the spirals of the weave. This type is used for rather long, flat cases or bags, but more particularly for spoon baskets, which are fitted with a twisted root handle to hang them to hooks or pegs on the wall. In later years ornamental baskets are often made in this weave.

5. Three-strand twined weaving, Uh ta'hk-ka (twisted). This gives a longer winding, rope-like appearance to the weave outside, while on the inside the regular twining stitch in its ridge-like regularity is seen. It is strengthening as well as decorative, and is often met with in circles at intervals near the bottoms of the larger, older baskets, which are required for the heavier work. It is in general use to-day as a single line of woof around the outer circumference of the cylinder basket, where the warp splints are bent upward to form the sides. Its more important use has been in the construction of the crown of the hat as well as of the cylindrical ornaments surmounting it, and other ceremonial head dresses among both the Haida and the Tlinkit.

The Tlinkits do not seem to have learned, or were forbidden

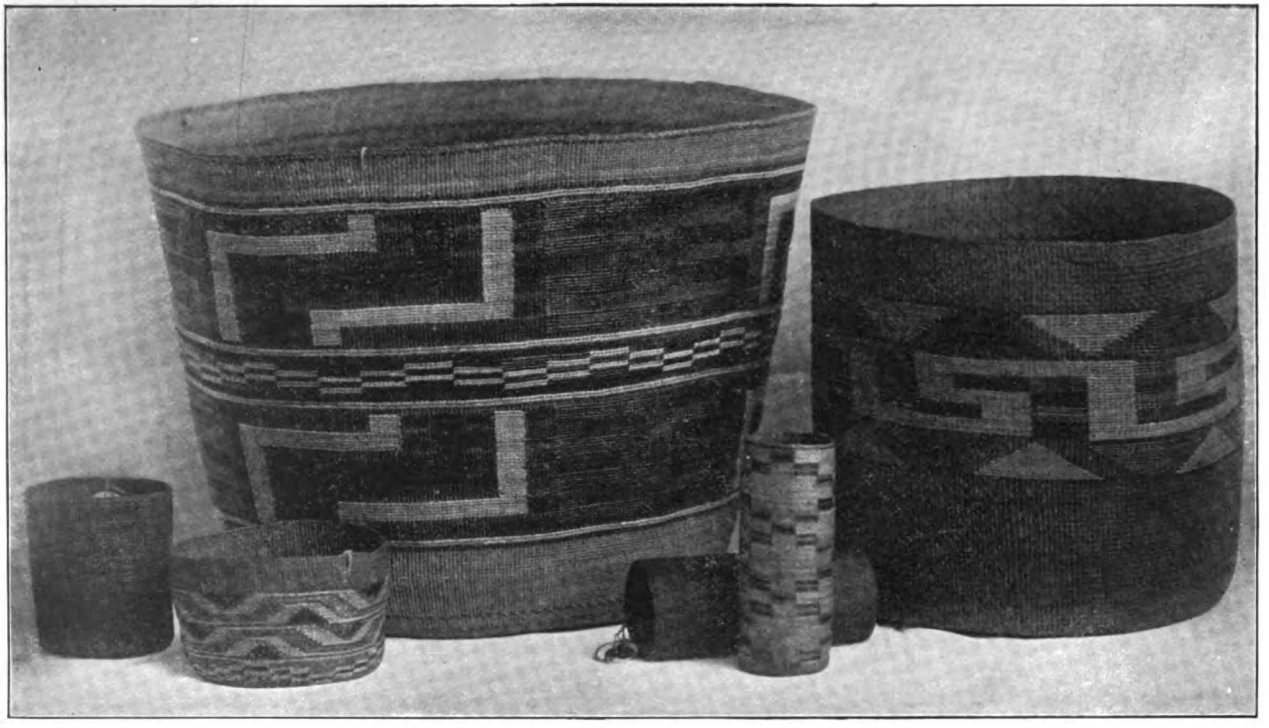


Plate 146. See page 321

TWINED WALLETS WITH FALSE EMBROIDERY, TLINKIT INDIANS, SOUTHEASTERN ALASKA

Fred Harvey Collection

by economy, in doubling their warp splints, to use strips from the outside of the root and to lay the wrong sides together, so as to have both outer surfaces smooth. This is shown in the mixed twine and checker work on the bottoms of baskets.

Plate 146 is a collection of Tlinkit twined basketry made from the roots of the spruce and decorated in false embroidery with wild rye or hair-grass, either in the natural colour or dyed.

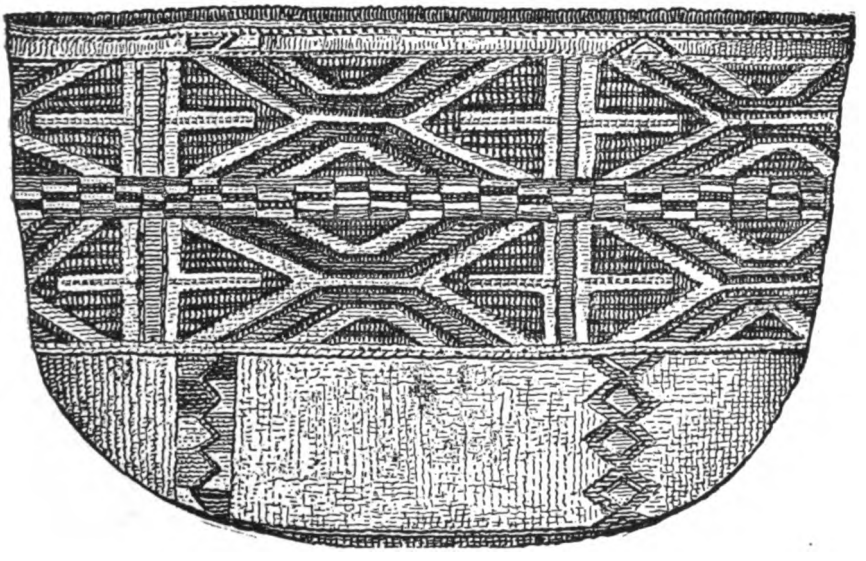


FIG. 137.
TWINED BASKET WALLET.
Tlinkit Indians, Alaska.
Collected by J. B. White.

It will be observed that the figures do not appear on the inside of the wallet. Attention is also called to the very fine workmanship on these old specimens, especially upon the large one in the middle. The ornamentation, in its symbolism, has reference to natural features and waterways. The composition of the ornament is in triangle and parallelograms.

Fig. 137, Catalogue No. 21,560, United States National Museum, is a twined basket wallet of the Tlinkit Indians. It is of bandbox shape when spread out, but is here shown as

folded for transportation. The bottom, warp, and twine are very roughly made of spruceroot splints, the former radiating from the center. The boundary of the bottom is a single row of three-strand twine. This method of ornamenting and strengthening their work was used by the Tlinkits, not only at the bottom, but along the sides and near the top. The rest of the body is in stripes done in false embroidery.

Figs. 138 and 139 illustrate the method of making false embroidery employed on the basketry of the Tlinkit Indians. As the woman proceeds with her work, she wraps the grass stem once around each strand of the regular twine when it comes outside. On the inside, therefore, there is no appearance of ornament; the figure plainly shows how this work is done, and it might be called a type of three-strand twined weaving in which one of the elements passes inside the warp. Ornamentation on this ware is also produced by dyeing the filaments of which the basket is made. This specimen is Catalogue No. 20,726, in the United States National Museum, and was collected by James G. Swan.

FIG. 138
FALSE EMBROIDERY.
Tlinkit Indians, Alaska.
Collected by J. G. Swan.

Fig. 140, from the Tlinkit tribes about Fort Wrangell, in southeastern Alaska, is a carrying wallet for general purposes. It is an interesting and important specimen in that it forms the connecting link between common plain in-and-out weaving and twined work, both plain and twilled (styles 1, 2, 3, and 4 of Emmons), from the tribes immediately north, and the Haidas. The specimen is made of spruceroot, and the rows of weaving are alternately twined and wicker over the entire surface of the wallet excepting the border. In examples already described, this combination of two weaves was seen on the bottoms, for economy, but in this piece the whole surface was

Plate 147. See page 323

GROUP OF TLINKIT BASKET-WEAVERS AT WORK,
SOUTHEASTERN ALASKA

Photograph from G. T. Emmons

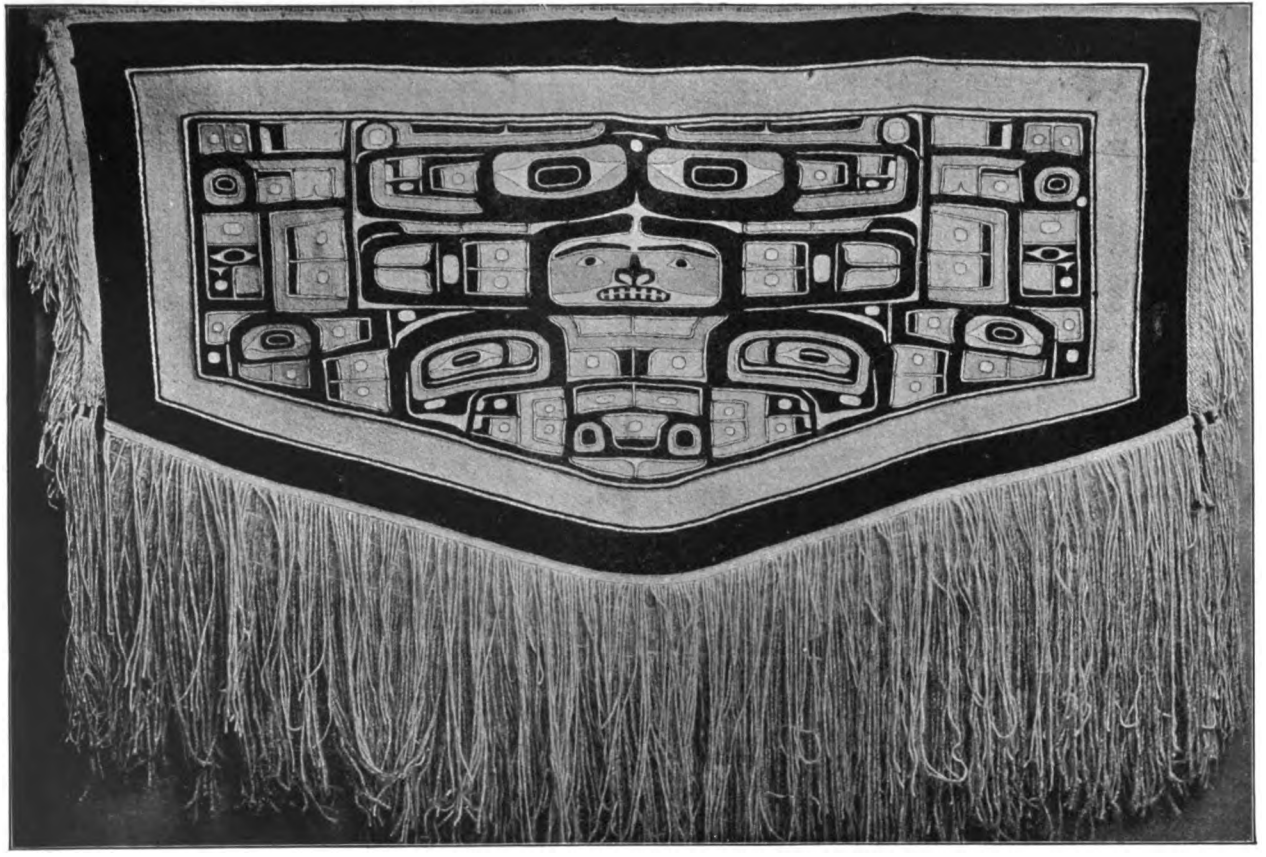


Plate 148. See page 325 CHILKAT BLANKET DONE IN TWINED WEAVING, THE PATTERNS SET IN, SOUTHEASTERN ALASKA

Collections of U. S. National Museum

thus covered. The coarser type is shown in fig. 141, from the Tlinkit Indians, taken from the bottom of basketwork inclosing a bottle. It will be seen that the first few rounds are plain twined work; after that the rows are far enough apart to allow an additional row of wickerwork or beading.

Specimen Catalogue No. 168,163 in the United States National Museum was collected in southeastern Alaska by Herbert G. Ogden, and specimen No. 73,755 was collected in Neah Bay, Washington, by James G. Swan.

Plate 147 represents a group of the Tlinkit Indian basketmakers. They were named Kolosch by the Russians more than a hundred years ago, because they wore labrets, or

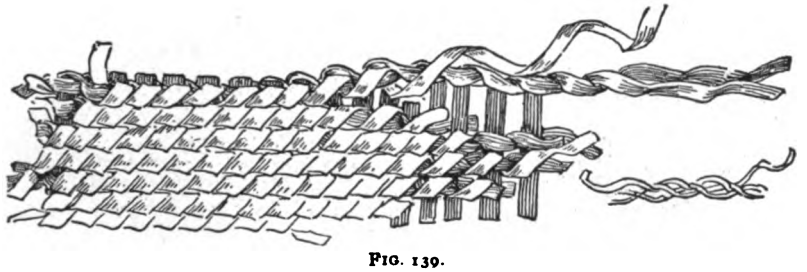


FIG. 139.
DETAIL OF FALSE EMBROIDERY.

plugs in their lips. The woman on the left side of the picture has a modest one in her lower lip, but specimens in the National Museum measure as much as three inches in diameter. Owing to the broken condition of their island home, and the large ownership of personal property, they are divided into innumerable villages or Kwans. The best-known basketmakers are Chilkats, Hoonahs, Sitkas, Takoos, Tongass, and Yakutats.* It will be noted in looking at the women in the group that the Tlinkits are a well-fed, vigorous race. The Russians spoke well of them, not only for their physical qualities, but for their intelligence.

The group is a study in more respects than in basketry.

* On the Ethnology of the Tribes of the West Coast, see Franz Boas, in the Proceedings of the British Association for 1884 and following years.

They are all clad in trade goods. As to jewelry, one wears her rings on her fingers, but the chief woman has hers in the septum of her nose. Old forms of basketry are mingled with covered bottles, and the ubiquitous can (Kanastron), formerly a basket, both in Greek and Tlinkit, stands by the side of the genuine article. Before leaving the group, it is worth while to recall that with thrifty tribes new tricks of handicraft are readily borrowed, and too much stress must not be laid on the assumption of identity of race because of identity of art. It is worth while to linger here a moment. The Attu woman

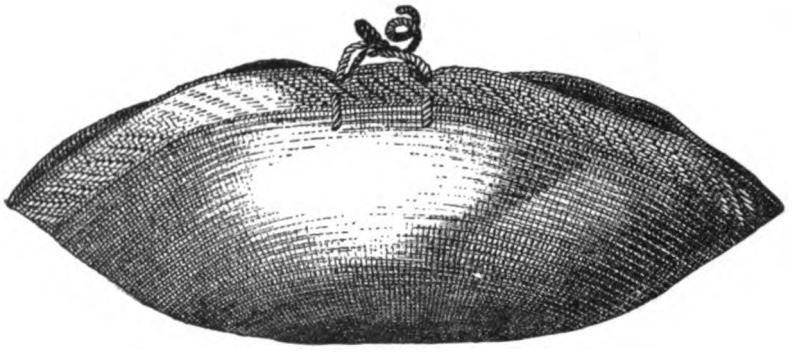


FIG. 140.
CARRYING WALLET.
Tlinkit Indians, Alaska.
Collected by Herbert G. Ogden.

as well as the old-time Algonquian tribes did suspend warp for baskets and matting, but here among the Chilkat is to be seen the pristine loom. It is not surprising when it is remembered that here the Rocky Mountain goat is at home.

On the main land of the northern Pacific slope the mountain goat (*Oreamnos montanus*) abounds. From the Chilkat Indians about Mount St. Elias southward to the Nez Percés, of Idaho, blankets are woven from the wool. These fabrics are, in their manufacture, the transition from basketry to loomwork. They are in twined weaving. The only shuttles are the skilful fingers of Indian women; the warp hangs down

loose from a pole or bar, and the work of twine is upward, precisely as in Haida basketry. (See Plate 148.)

Vernon Bailey says of the material that the winter coat of the mountain goat is a dense piece of long, soft wool, with strong, coarse hairs scattered through it. In spring and early summer, when the wool is being shed and hangs in loose strings on the goat it catches on bushes and rocks and the iow branches

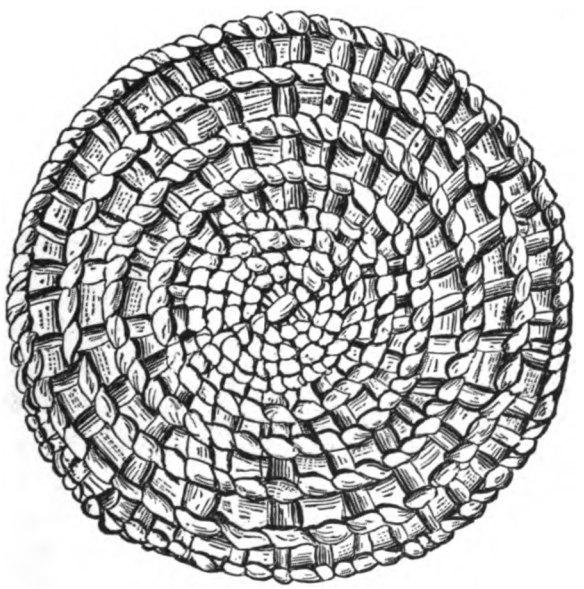


FIG. 141.
TWINED AND WICKER WEAVE.
Tlinkit Indians, Alaska.
Cat. No. 73,755, U.S.N.M. Collected by J. G. Swan.

of timber-line trees. On the slopes above timber line in May and June every bush and tall dry weed will be festooned with tufts of wool that could be picked off in handfuls. In a good goat region the Indians might gather wool enough for a large part of their clothing without the trouble of killing one.

Fig. 142 is a section of a wallet made by the Chilkat Indians. The material is the young root of spruce. It is here introduced to show the effect on the surface of several kinds of weaving

before described. Beginning at the bottom of the drawing there are ten rows of alternate plain twined and checker weaving. At the margin of this lower portion, and also at the upper margin of the drawing, will be found a row of twined work set on the regular twined weaving for strength and ornament. The upper portion of the wallet is a mixture of plain twined work over one warp splint and twilled twine weaving over two warp splints, making a diagonal pattern on the surface. The rope is made of the same material.

FIG. 142.
WALLET.
Chilkat Indians, southeastern Alaska.

HAIDA BASKETRY

The Haida Indians live on Queen Charlotte Archipelago and adjacent islands. Their basketwork is all in twined weaving, and differs from that of the Tlinkits in artistic finish only, owing probably to the demands of trade. Their wallets of spruce are devoid of decoration, save here and there a band in plain black colour; but hats made by these Indians are masterpieces in execution and ornamental weaving. The crown is in three-strand or plain twined weaving of the most delicate workmanship, and the fabric is perfectly water-tight when thoroughly wet. Ornamentation is introduced into the brims by a series of diamond patterns in twilled weave covering the whole surface. This decoration is produced thus: Beginning at a certain point, the weaver includes two warp strands in a

half twist instead of one; then makes two regular twists around single warp strands. The next time she weaves around she repeats the process, but her double twist is one warp stem in advance of or behind its predecessor. A twilled effect of any shape may be thus produced, and rhombs, triangulated fillets, and chevrons be made to appear on either surface. (See figs. 143 and 144.)

FIG. 143.
HAT IN PINE TWINED WEAVING.
Haida Indians, British Columbia.
Cat. No. 89,033 U.S.N.M. Collected by James G. Swan.

The fastening off of the work is done either by bending down the free ends of the warp and shoving them out of sight under the twists of the web, or a braid of four strands

FIG. 144.
DETAIL OF FIG. 143.

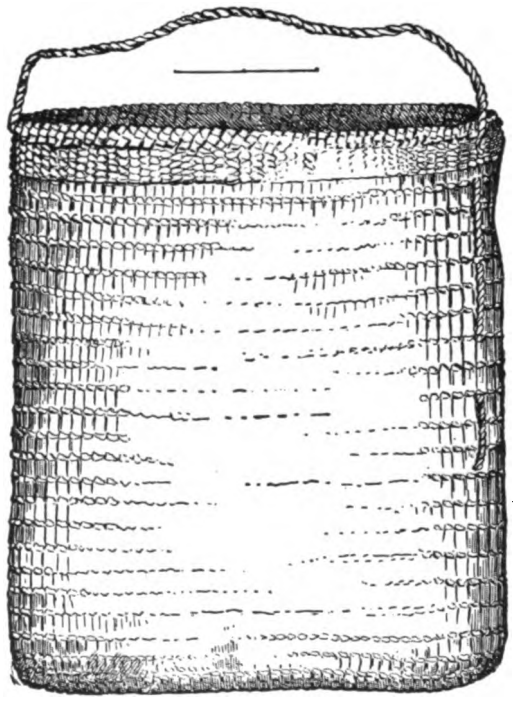


FIG. 145.
TWINED OPENWORK BASKET.
Haida Indians.
Cat. No. 88,964, U.S.N.M. Collected by James G. Swan.

forms the last row, set on so that the braid shows outside and only one strand at a time shows inside. The ends of the warp splints are then cropped close to the braid or it is held on by a row of plain twining.

Special attention should be paid to the fact that the ornamentation on these hats is painted and not woven (see fig. 143). Not far away, on the mainland, the same motives appear on blankets, woven into the texture. Figs. 143 and 144 show the head, wings, feet, and tail of the duck, laid on in black and red in the conventional manner of ornamentation in vogue among the Haidas and used in the reproduction of their various totems on all of their houses, wood and slate carvings, and the ornamentation of their implements.* Shells, beads, and feathers are often sewed on in profusion.

FIG. 146.
DETAIL OF FIG. 145.

* A very interesting instance of survival is to be seen in the rag carpets of these Indians. The missionaries have taught the women to save up their rags and to cover their floors with pretty mats. They are allowed to weave them in their own way, however, and the result is constructed on the ancient twined model.

Catalogue No. 88,964, collected by J. G. Swan, is a twined openwork basket of spruceroot made by the Haida Indians. This piece of coarse workmanship shows both phases—the open and the close weave in rough inner splints. The handle is a twine of the same material fastened into the weaving while it is in progress. The border is effected by bending down the warp elements at the rim externally and sewing them in place with a row of twined weaving.

A square inch of this specimen taken near the top, where the openwork and the closework come together, is shown. (See figs. 145, 146.)

Fig. 147 shows an unfinished Haida cylindrical basket attached to the stake or frame on which it is woven. In order to explain the process of manufacture, the bottom is in plain twined weaving; at the border where this joins the cylindrical side is a row of three-strand; and four rows of plain twined weaving of the body come next, the unfinished portion exhibiting the warp as it appears before weaving.

Especial attention is here called to the sharpened stake, which has a circular board on top.

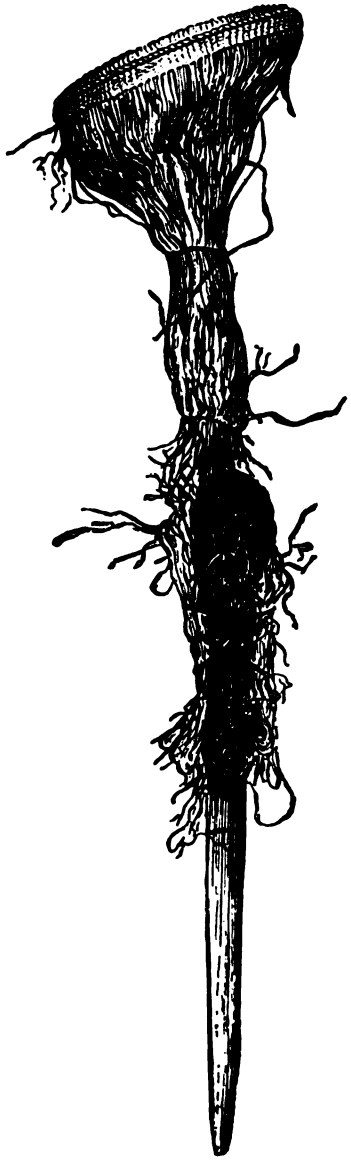


FIG. 147.
UNFINISHED BASKET.
Haida Indians.
Collected by James G. Swan.

This is driven into the ground, and the woman seated works upward instead of downward, as in most cases. This specimen, Catalogue No. 89,033 in the United States National Museum, was procured in Queen Charlotte Islands by James G. Swan. It will be remembered that in an ancient drawing showing how the Virginia women made basketry, the woman is seated in precisely the same fashion and is working from below upward. (See fig. 148 and Plate 144.)

FIG. 148.
VIRGINIA INDIAN WOMAN WEAVING A BASKET.
After W. H. Holmes.

Plate 149 represents old twined wallets of the Haida Indians, Queen Charlotte Islands, British Columbia. The material is splints of spruce, some of which have been dyed simply by immersing in dark-coloured mud. The Haidas used little colour decoration other than black bands in their work, but they have learned the art of producing figures by including more than warp element in the twining. They also know the art of three-strand twined work, as will be seen on the upper border of the two larger wallets. The borders are finished off by false embroidery.

Plate 150 represents a company of Haida Indian basket-makers, photographed by J. G. Swan. They are in modern dress, but wear nose-ring and labret common to their tribe, and are also weaving upward.

THE FRASER-COLUMBIA REGION

Basketry is the most expressive vehicle of the tribe's individuality, the embodiment of its mythology and folklore, tradition, poetry, art, and spiritual aspiration.—NELTJE BLANCHAN.

The next general area for study will be the drainage region of the Fraser River and the Columbia River. The families to

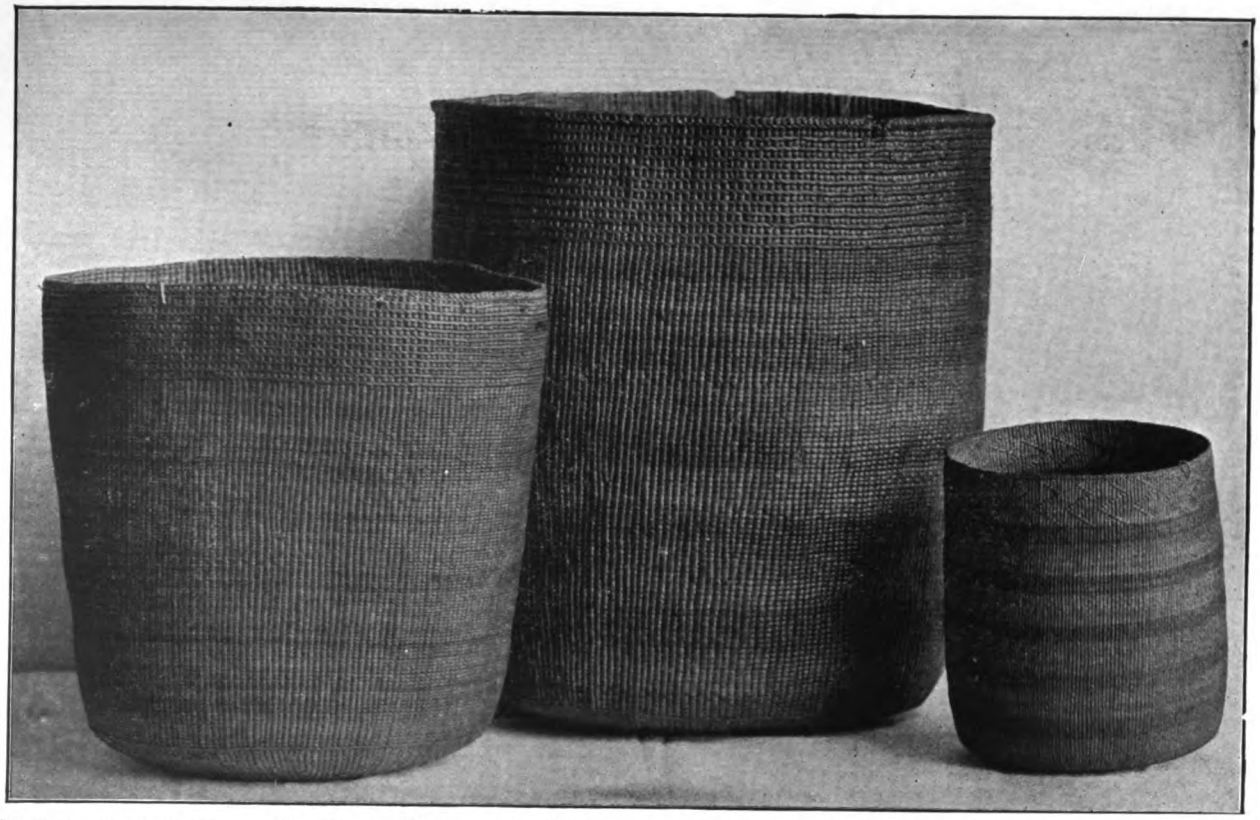


Plate 140. See page 330 OLD HAIDA WALLETS IN TWINED WEAVING, WITH BRAID ON THE BORDERS. QUEEN CHARLOTTE I., B. C.

Fred Harvey Collection

be visited will be the Chimmeseyan, Wakashan or Aht, Salishan, Shahaptian, and Chinookan. Other smaller groups are scattered around and will be treated at the proper place in the text. The transition from southeastern Alaska to this area is almost imperceptible in some respects, and radical in others. The Tlinkit false embroidery will not disappear, but it will be remanded to a far humbler place. The roots and inner bark of the cedar will occupy the front rank. Coiled and imbricated work, unknown among the Tlinkits and Haidas, will bloom out in British Columbia and Washington. The semiflexible wallet will be replaced by the rigid cooking basket and the soft bags of hemp. The differentiation from the next area south of it will also be marked.

The small Chimmeseyan family, also called Tsimshian and better known as Nass, are the extreme northern of the group. Their basketry is of root and runs largely into the mixed twined checker, and twilled.

Necessarily coming southward from the spruceroot country to the cedar area would have the effect to change much of the basketry from rigid surfaces to flexible and from twined weaving to checker and twilled work. The National Museum possesses no specimens of Chimmeseyan ware of striking individuality.

The Wakashan tribes occupy northern and western Vancouver Island, the coast of British Columbia, and a small point of land in the northwest corner of Washington. They are generally known by the name Aht or Nootka on Vancouver Island, and include Boas's Kwakiutl and the Bella Bella and Haeltzuk on the mainland. In recent years they have been studied by Boas, by Tolmie and Dawson, and by Swan.

A list of authorities will be found given by J. W. Powell* and by Boas.†

In addition to the matting, both checker and twilled,

* Seventh Annual Report of the Bureau of Ethnology, 1891, p. 128.
† Reports to the British Association, 1889–1891.

quite common throughout this region, the Wakashan tribes of Vancouver Island and Washington make a type of basketry which is called in this paper the bird cage or wrapped twined work, in which one element of the weft remains inside of the basket, and the other element, which is more flexible, is wrapped about the decussations of the warp and the rigid element of the weft. It might also be called the "fish trap" style, since without doubt the finer basketry is the lineal descendant of the rude wicker fish trap. Imagine a number of stakes driven into the ground pretty close together. A horizontal pole is laid against them in the rear, and by the wrapping of a withe around the pole and each upright stake diagonally on the outside and vertically on the inside, a spiral fastening is produced. It is shown in the openwork basket, Catalogue No. 23,480, United States National Museum, made by a Clallam Indian. This wrapping crosses the two fundamentals in front at an angle and the horizontal frame piece in the rear at right angles, and the lacing may always run in the same direction, or the alternate rows in opposite directions, as in fig. 149. As a matter of fact, in a soft and pliable material this operation pushes the uprights forward a little, giving to the fabric an appearance of the lathe work on the back of a watch. (See fig. 150.)

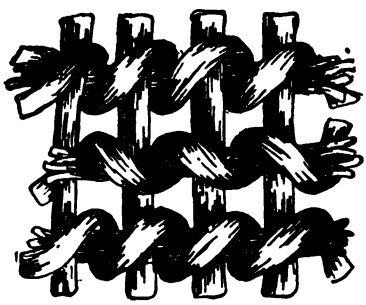


FIG. 149.
DETAIL OF WRAPPED BASKET.
Clallam Indians.
Collected by J. G. Swan.

The Wakashan weaving is not confined to this particular technic, but, as will be seen in the illustrations here shown (fig. 151), it is checkerwork on the bottom, three-ply twine between, separating the checkerwork from the plain twine commencement of the body. The sides are built up of cedar bark warp, both vertical and horizontal, and a wrapping of

Plate 150. See page 330 HAIDA BASKET-MAKERS, QUEEN CHARLOTTE I., B. C., SHOWING UPWARD WEAVING

Photograph from J. G. Swan

golden-coloured grass stems. These straws take different coloured dyes readily, and so the Makahs have learned to ornament their baskets with geometric patterns in black, yellow, drab, red, blue, etc. The pattern, therefore, is alike on both sides, although the wrappings are, as in Clallam, Nez Percé, and other specimens, inclined on the outside and vertical on the inside.

This specimen, Catalogue No. 23,346 in the United States National Museum, was collected, with many others (Nos.

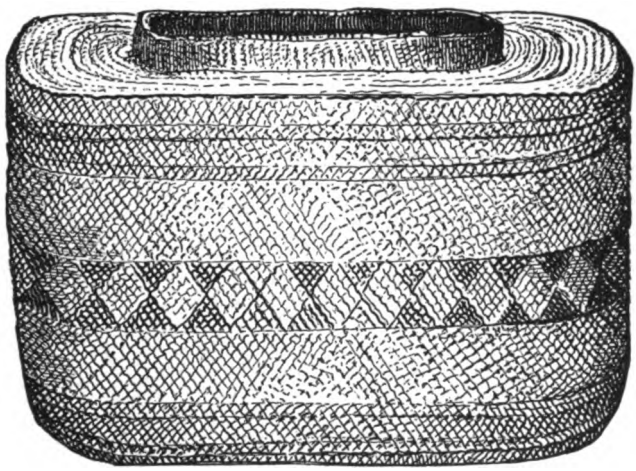


FIG. 150.
WRAPPED TWINED BASKET.
Makah Indians, Cape Flattery
Collected by James G. Swan.

23,343 to 23,368), in Neah Bay, Washington, by James G. Swan. (See figs. 149–151.)

In the Peabody Museum of Harvard University are eight old basket hats, supposed, by C. C. Willoughby, to have originated among the Southern Wakashan tribes, probably the Nutkas. Lewis and Clark described them as "made of cedar bark and bear-grass interwoven in the form of a European hat with small brim. They formed a small article of traffic with the whites, and their manufacture is one of the best exer-

tions of Indian industry." They say that "the only covering for their head is a hat made of bear-grass and the bark of cedar interwoven in a cone form with a knob of the same shape at the top. The colours are generally black and white only, and the designs are squares, triangles, and rude figures of canoes, and seamen harpooning whales." Captain Cook found the same form of head covering worn by the Indians of Nutka Sound. (See Plate 151.)

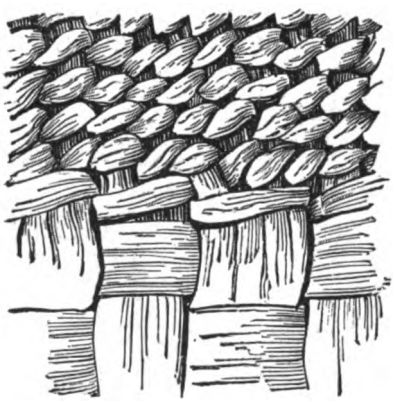


FIG. 151.
BOTTOM OF MAKAH BASKET.

Mr. Willoughby* describes the hats in the Peabody Museum (Plate 151) as follows:

They are all in twined weaving, and are made principally of cedar bark and grass spires. The construction is double, as shown in the cross-section (fig. 153). Each headpiece consists really of two hats, an inner and an outer one, joined at the rim, the last few pairs of twisted woof elements of the outer hat inclosing also the ends of the warp of the inner. The inner hat, or lining, is coarsely but neatly woven of cedar bark, and only in one specimen is there a knob at the top of the lining corresponding to that of the outer hat. Upon the under side at about three inches from the rim each warp element is doubled upon itself, forming a loop about three-fourths of an inch long. Through these loops is run a strong double cord of Indian hemp. The loops are bound together by twined weaving (fig. 152), and form an inner rim edged with the cord of hemp, which fits the head snugly. To this is fastened the thong which passes beneath the chin of the wearer.

The exterior or outer hat is woven principally of grass spires and cedar bark. In most of the specimens a narrow strip below the knob is made of fine cedar roots. The warp appears to be formed of split roots, and is fine and strong. The grass of the woof was originally an ivory white, the selected cedar bark used in conjunction with it being usually stained a dark brown or black.

* American Naturalist, XXXVII, 1903, pp. 65–68.

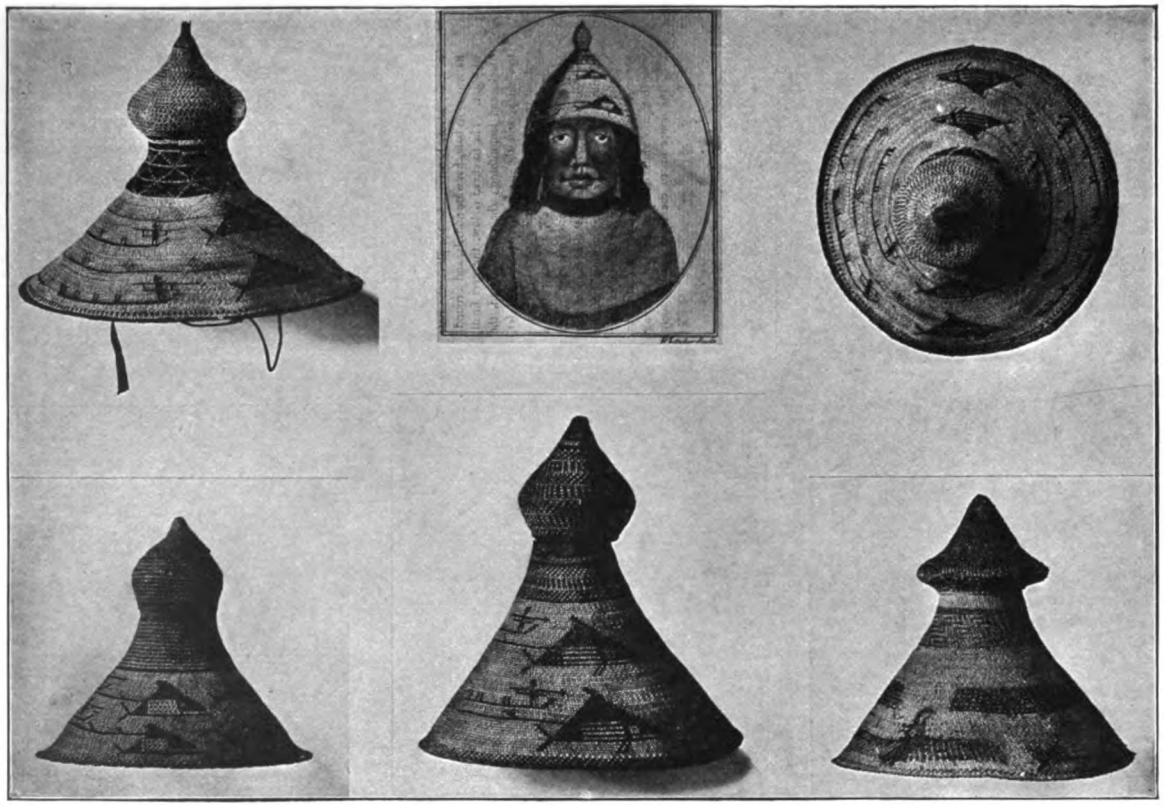


Plate 151. See page 334

DOUBLE BASKETRY HATS OF THE ANCIENT NUTKAS, VANCOUVER I.

Photograph from C. C. Willoughby, Peabody Museum

Each strand of the twisted pair of woof elements forming the design is composed of a grass spire overlaying a strip of cedar bark of the same width, the strand thus formed being white upon one side and black upon the other. These double strands are used not only where figures appear, but throughout the groundwork of the design as well. The figures are principally black upon a white ground. In forming them, the strands are simply reversed, the black sides which were concealed beneath the grass spires in the

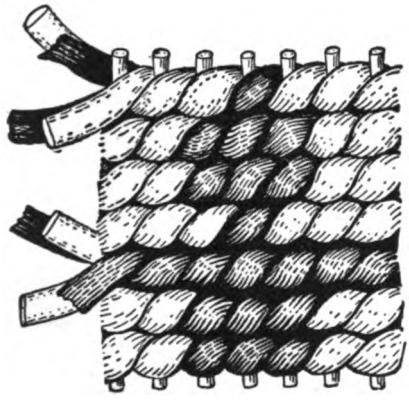


FIG. 152.
DETAIL OF NUTKA HAT.
After C. C. Willoughby, Peabody Museum.

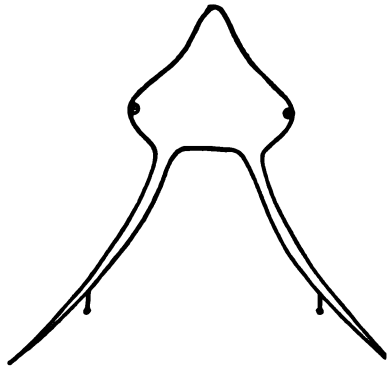


FIG. 153.
CROSS-SECTION OF NUTKA HAT.
After C. C. Willoughby, Peabody Museum.

white background being carried outward. In some of the specimens the knob at the top is woven separately and afterward joined to the hat. (See figs. 152 and 153.)

Comparing the descriptions with the technical processes worked out in this paper, it is evident that the Nutka tribes understood what is called overlaying. It is not the Makah wrapped weaving, nor like the Nez Percé and other Shahaptian weave, but will be found in the Modoc and some Californian tribes as well as abundantly among the Salish (see Plate 155, fig. 5). The double hat is suggestive of the Orient, from which the royal Spanish fleet returned by way of Vancouver every year for two centuries (1570–1770).

The National Museum has a Quilleute (Chimakuan) example of twilled weaving from Vancouver Island, which should be

compared with Clallam ware. It is a large fish-basket made from the split root of a cedar. Attempts at ornamentation are, first, in using alternately the smooth, natural wood and the inner, coarse surface of the splint, also by introducing strips in cedar root with the bark adherent, and finally by laying on the outside of certain strips leaves of bear-grass. With this variety of material, although the basket is as coarse as it can be, the effect is excellent. The finishing off is in three rows of twined weaving, in which black yarn and bear-grass are laid on the fiber to give variety and colour. The upright elements in the weaving are bent down on the inside and held together by a continuous row of button-hole stitches. On the border is a scallop formed by a two-strand rope which passes underneath the border, back, and through itself. Dimensions: Height, 18 inches; width, 24 inches. Collected by C. F. Newcombe. (See Plate 152.)

Plate 153 is a delightful mixture of two extremes in culture. Two Makah or Nutka women are clad in calico, woolen blanket, piano cover, bandana handkerchiefs, etc., not neglecting the latest patent in safety pins. They are seated on a mat of cattail (*Typha latifolia*) stems, sewed together in genuine aboriginal fashion, known before Columbus. And their fingers are following their conservative thoughts as if these cunning weavers had been born centuries ago. They are making from filaments of cedar bark and leaves of squaw-grass the kind of twined weaving called wrapped in this work (figs. 13, 14). The warp is plain, twisted from cedar bark. One element of the weft is of the same material and laid horizontally inside the warp; the other weft element, of squaw-grass (*Xerophyllum tenax*), is wrapped in a continuous coil about the intersections of the other two elements. The photograph is from Capt. D. F. Tozier.

One of the largest families and most diversified, so far as industries are concerned, are the Salishan tribes, east and south of the Wakashan. A small and detached body of them is

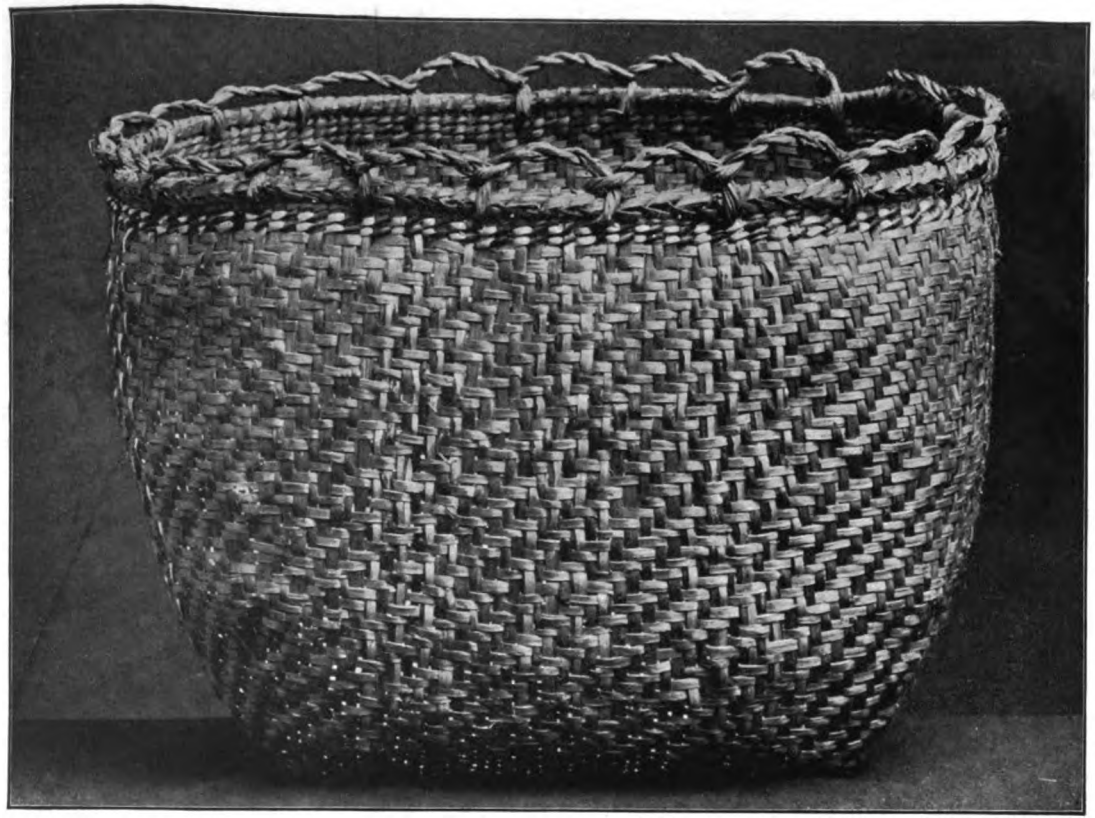


Plate 152. See page 336

TWILLED BASKET OF THE QUILLEUTE INDIANS, NORTHWEST WASHINGTON

Collected by C. F. Newcombe for U. S. National Museum

to be found on Bentinck Arms, northern British Columbia, hemmed in on the east by Athapascan tribes and on the west by Wakashan tribes. The rest of the family are spread out in British Columbia and Washington, extending from Puget Sound northward, southward, and eastward, across Idaho and even into Montana. A small body of the same family are on the Oregon coast, about the forty-fifth parallel.

Situated, as these tribes are, in the midst of so many other linguistic families, it is not surprising to find a great variety in the types of their basketry. In the plates here shown (Plates 154 and 155), fig. 1 represents plain checker weaving; fig. 2, twilled weaving, in which both warp and weft pass over two; fig. 3, another form of twilled work, in which warp and weft pass alternately over two and under one. Figs. 4 and 5 show the methods of coiled and imbricated sewing in the bottom and on the body of a Thompson River or a so-called Klikitat basket. Especial attention will be called later to these types. Fig. 6 is plain twined weaving in openwork. Fig. 7 is an example of plain twined weaving in openwork over crossed warp of a special character in which every alternate one is vertical and the other inclined. It can be easily seen by looking at the figure that the odd warps are arranged vertically and parallel, every other one turns to the left and is caught, not in the twist just above it, but in the first one beyond. Figs. 8 and 9 show the outside and inside of latticed or bird cage work; fig. 10, a form of twined work in which the tough fiber is overlaid by grass leaves or other colored fiber, adding to the ornamentation but not to the strength; fig. 11, false embroidery, in which the outer element of the twine is wrapped with an additional filament. Myron Eells, who has spent many years among them, and to whom Plates 154 and 155 are to be credited, asserts that styles of weaving peculiar to the stocks near by are practised by a few women of Salishan tribes. This can be accounted for in two ways—women from these outside stocks may have married into the

tribes under consideration, or, as is frequently the case, the Salish women, in order to learn something new, have taken up the methods of their neighbours.

Immediately south of the Haidas and Tlinkits, the bark of the white cedar (*Thuja plicata*) becomes common, the inner portion is quite tenacious, and, since filaments of almost any required width and length may be obtained, checkerwork weaving is in demand for mats, sails, receptacles for all sorts of objects, parts of house furniture, and even of clothing. The figure here shown is a typical example of many hundreds of

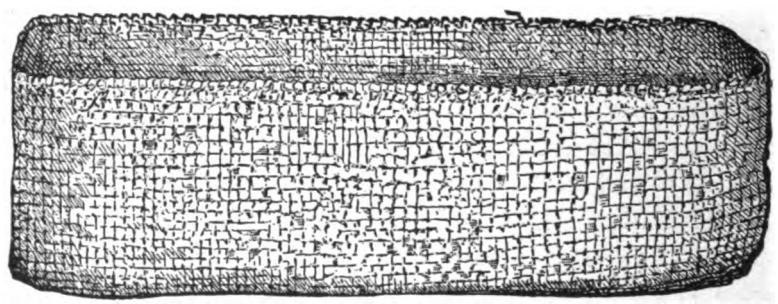


FIG. 154.
CHECKERWORK BASKET.
Bilhula Indians, British Columbia.
Collected by James G. Swan.

such baskets to be found in collections. The bottom and sides are in the same type of weaving. By an endless variety of real and proportional width of warp and weft and by colouring some of the strips an indefinite number of patterns may be produced. (See fig. 154.)

In many cedar bark receptacles of this region the two sets of filaments—warp and weft—run diagonally—that is, they are not woven as in a loom, but the maker begins at the corner. Looked at vertically, the surface has a diamond rather than a checker appearance, but from the point of view of the maker the intersections are square. Again, but much more rarely, three sets of filaments are involved, two belonging to the warp and the other one to the weft. The warp elements cross at

Plate 153. See page 336

NUTKA OR MAKAH WOMEN MAKING WRAPPED TWINE WEAVING. NEEAH BAY, WASH.

Photographed by D. F. Tozier

right angles or less, and the weft elements run across through the intersections, making a series of rhombs. This same technic is almost universal in Japan.

In addition to the oblique method of weaving the checker patterns in cedar bark, occasional diagonal or twilled weaving is to be seen in the same area.

A large collection of these was gathered by James G. Swan along the coast of British Columbia, and are now for examination in the United States National Museum.

Ornamentation in bark work is effected both by introducing different coloured strands and by varying the width of the warp and the woof threads. In many examples the bottom of the basket is bordered and outlined with one or more rows of the twined or plaited style of weaving to give greater stability and definition to the form. Cedar mats of large size and made with the greatest care enter as extensively into the daily life of the Indians of this vicinity as do the buffalo robes into that of the Dakota Indians.

The Bilhulas made very neat baskets, called "Zeibusqua," as well as hats and water-tight vessels, all of fine cedar roots.

> They boil the cedar root until it becomes pliable to be worked by the hand and beaten with sticks, when they pick the fibers apart into threads. The warp is of a different material—sinews of the whale, or dried kelp thread.

They also are expert in weaving the inner bark of the cedar.

It is not astonishing that a material so easily woven should have found its way so extensively in the industries of this stock of Indians. Neither should we wonder that the checker pattern in weaving should first appear on the west coast among the only people possessing a material eminently adapted to this form of manipulation. It is only another example of that beautiful harmony between man and nature which delights the anthropologist at every step of his journey.

Farther south in British Columbia a Salish people demanding careful attention are those formerly called Couteau or Knife

Indians by the Hudson's Bay Company's people. Their home is the southern interior of British Columbia, mostly east of the Coast Range, and is about one hundred miles long and ninety miles wide. Their basketry is described by James Teit, of Spences Bridge, British Columbia.* The basketwork above Lytton is of birch bark, spruce bark, and willow twigs, and the rims are ornamented with stitches made from the bark of *Prunus demissa.* The Indians on the lower division of the Thompson River and on the Upper Fraser make beautiful coiled and imbricated baskets of cedar roots (*Thuja plicata*). This type of basketry is also made by the Chilcotin and Lillooet, and Shushwap, who are said to employ spruceroot.

William Arnott, of North Bend, gives the following Thompson River Indian names for baskets: Tsai, ordinary oblong style; spanach, small oblong and square; spa panach, very small; nikwoeten, round; spanikwoeten, small round; sklokw, very large.

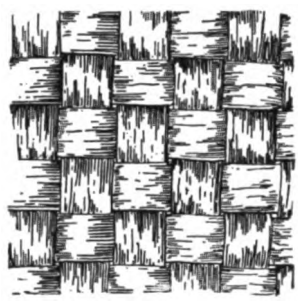
Wallets are made of a twined weaving, the character of which is shown in Teit's fig. 132. Designs on these fabrics are in embroidery or by weaving coloured grasses or bark twine into the fabric, as shown in the same figure. This style of weaving seems to have been acquired recently through intercourse with the Sahaptin.

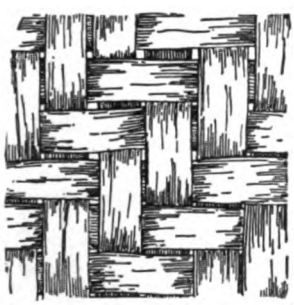
The Lower Thompson Indians weave mats of strips of cedar bark of the same style as those used by the coast Indians (Teit's fig. 133).

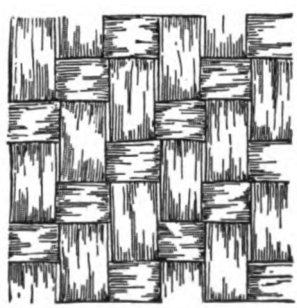
At the present day, rag mats or rugs are often made from scraps of cloth, calico, etc. The patterns on these are mostly the same as those on basketry.

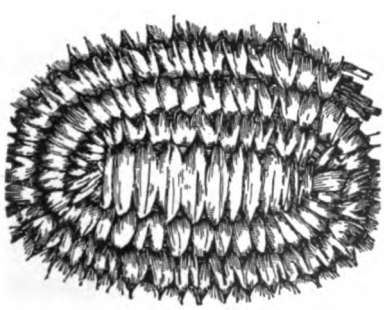
The Thompson Indians also practise twined weaving in coarse bagging and in matting from tule (*Scirpus lacustris*), bulrush (*Scirpus maritimus*), and the twined weft of the bark of *Apocynum cannabinum.* These Indians also know how to

* Memoirs of the American Museum of Natural History, II, 1900, pp. 163–392.









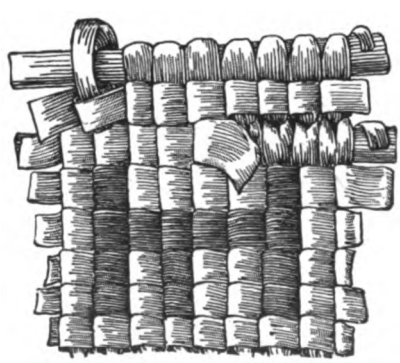


Plate 154. See page 337

VARIETIES OF TECHNIC PRACTICED BY SALISH WOMEN, WASHINGTON

1
2 3
4 5

make mats by stringing them. The reed or stick is perforated at two or more places and a cord passed through the holes.

It is interesting to find among them also blankets made from twisted strips of rabbit skin used as weft and held together by twined weaving. Attention is especially called to a method of ornamental overlaying among the Thompson Indians that has not a wide distribution. An ordinary wallet is made of twined work from the fiber of *Apocynum cannabinum* and *Asclepias speciosa*. In the fabric, these do not differ from the world-wide twined weaving, but in the ornamentation a strip of grass or other coloured material—maybe corn husk—is wrapped around the twined work as it proceeds. Comparing this with the Makah wrapped work, the twined weft takes the place of the strip laid behind the vertical warps. The wrapping is precisely the same, but in the Thompson River work the patterns are quite similar on both sides, only the elements are oblique on the outside and vertical on the inside. (See Teit fig. 132.)

The weaving of blankets by basketry processes was formerly an important industry among them. The coast Indians utilised both dog hair and goat hair in their manufacture, but the Thompson Indians seemed to have used the latter only. Sometimes the wool was made whiter or cleaned by mixing a quantity of baked white diatomaceous earth with it and beating the whole with a flat stick. The manner of making the thread is exactly the same as that described by Dr. Boas for the process employed by the Songish. The loom and spindle are also alike, excepting that both disk and shaft of the latter are of wood. The whole process of blanket-making and the implements used are said to be those found among the lower Fraser Indians. Most blankets had a fringe of tassels, 6 to 9 inches in length, along one end. Black bear's hair made into threads, and spun threads of goat's hair dyed either yellow with lichens or red with alder bark, were woven into the blankets in patterns

similar to those used in basketry. The Indians of Spuzzum continue to make these blankets at the present day.

For making nets, threads of the bark of *Apocynum cannabinum* were used. A wooden netting stick (Teit's fig. 134) served for making the meshes of equal size. The meshes were tied with a square knot.

Eells stated that the imbricated basketry is made by the Puyallups, Twanas, Snohomish, Clallam, Skagit, Cowlitz, Chehalis, Nisqualli, Spokan, and Squaxin who are Salish, as well as by the Yakima and Klikitat Indians of middle and western Washington who are Shahaptian. Only women and girls are basketmakers; they use, in securing material, the ordinary root digger. Pieces of the desired length and about the thickness of a finger are buried in the ground to keep them fresh. At the proper time they are taken out and peeled with a sharp stone or knife and hung up to dry. When needed, they are split into long strips by means of the bone awl. The pieces of the desired width and thickness throughout are used for stitching; the others form the foundation of the coil which in the weaving is kept of uniform thickness by adding fresh material. Foundations are also in narrow strips of wood. Mr. Teit makes the important assertion that the stitches of the preceding coil are intentionally split by the awl. Examples of this kind of work are common in collections. On the bottom and back as well as ends of the baskets ornamental strips are often overlaid and decorated by a process here called beading. In many examples, strips of cedar and other woods are used as foundations. The method of ornamentation employed is imbrication, described on page 174, the material for the overlaying being a glossy yellow-white grass.

As soon as enough is known about the geographic distribution of this imbricated type of weaving, a better classification can be made. The following characteristics will suffice as a general guide:

1. *Foundation.*—Either a bundle of splints, somewhat

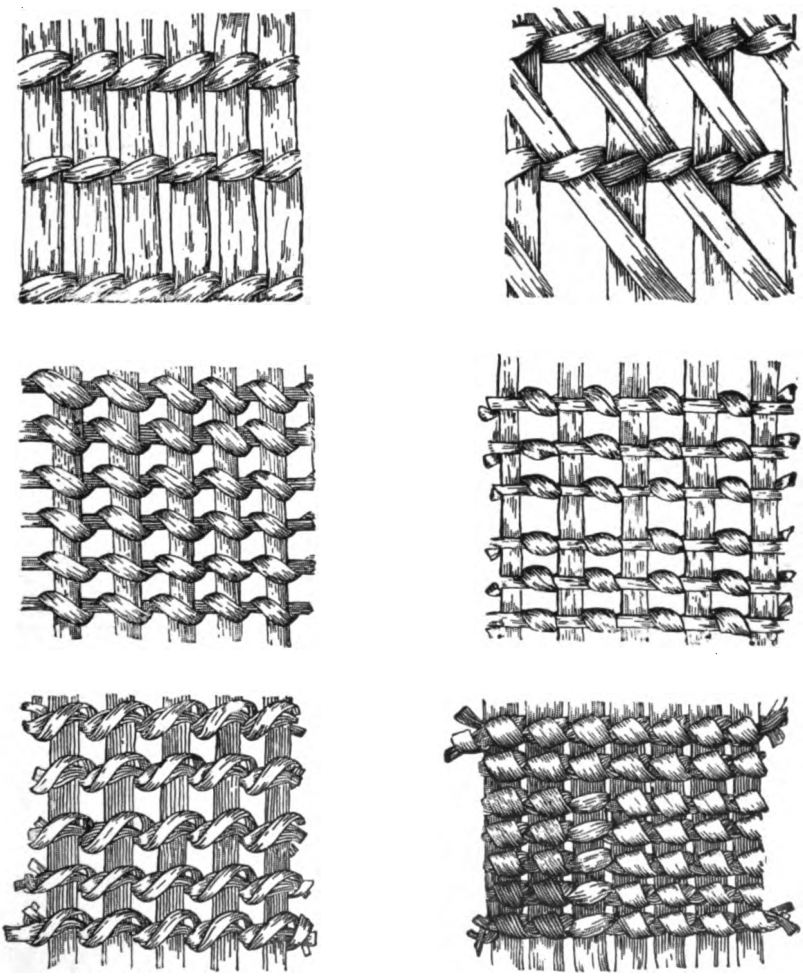


Plate 155. See page 337

VARIETIES OF TECHNIC PRACTICED BY SALISH WOMEN

6 7
8 9
10 11

Plate 156. See page 343 COILED AND IMBRICATED BASKETS WITH COVERS. FRASER RIVER, B. C.

Fred Harvey Collection

cylindrical in form, or narrow flat strips of wood usually laid in pairs.

2. *Sewing.*—All done in splints of root; in some baskets the stitch is carefully and systematically bifurcated on the outside, in others it is whole.

3. *Bottom.*—Either a flat spiral, circular or elliptical in outline, as in most of the Washington varieties and in some of the farthest removed of the British Columbia specimens, or a series of straight rows of sewing. The bottoms of many of the baskets of this last type are receding, and even a border is built up outside of the structure of the basket. (Compare Plate 157 with Plate 163.)

4. *General shape.*—Either conical, rectangular, pyramidal, or fanciful.

5. *Decoration.*—Designs covering the whole surface; designs on the upper part of the surface only; and designs around the middle, leaving the top and bottom plain or separately figured. In some, beading is mixed with the imbricated ornament. It may not amount to tribal differences, but some baskets are decorated in front with imbrications, and are plain or beaded on the back and ends. It is impossible with the knowledge at present in hand to make a perfect ethnic chart of this wonderfully varied type of workmanship.

Plate 156 is a covered basket box in imbricated coiled work, from Douglas Harbor, British Columbia, now in the collection of Fred Harvey, Albuquerque, New Mexico. The foundation and sewing are of cedar or spruce root, and the imbrications are in squaw-grass and cedar bark. The noticeable feature in this specimen is the coiled work. In order to diminish the amount of sewing, the basketmaker has thought of the expedient used by the Mescalero Apache Indians of the south, and seen on specimens from other localities, of widening the foundation of the coil. In the Douglas Harbor examples, strips of wood take the place of two or more stems arranged one above another.

Plate 157 represents Thompson River and Fraser River coiled baskets, showing both imbrication and overlaying with grass. The specimens shown in this plate are in the collection of Miss Anne M. Lang, The Dalles, Oregon. They should be examined carefully with respect to the characteristics of foundation, stitch, shape, design, and quality mentioned above.

Fig. 155 is a precious old coiled and imbricated basket. The bottom is made up of fifteen foundation rods laid parallel. Each one of these is overlaid by a strip of bright yellow squaw-

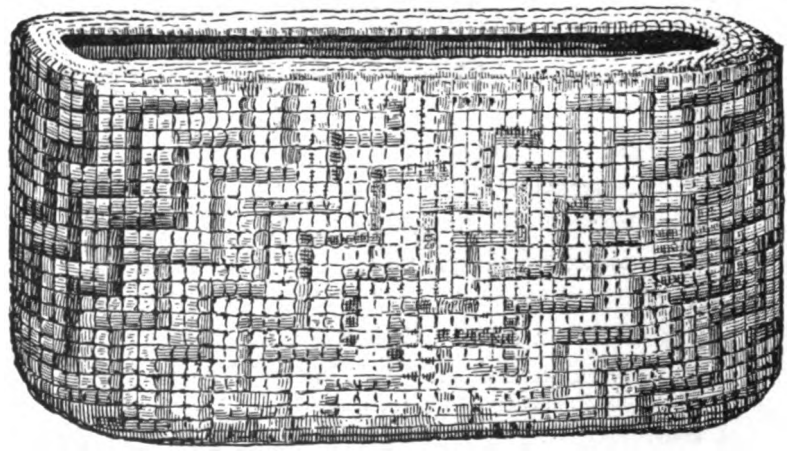


FIG. 155.
COILED AND IMBRICATED BASKET.
Cat. No. 60,235, U.S.N.M. Collected by J. J. McLean.

grass. Thus prepared, these rods are sewed together by coiled stitching, which is split or bifurcated, and some trifurcated in the operation. Again, while the stitching is solid on the inside, those in sight are from one-eighth to one-fourth of an inch apart on the outside, showing that every other stitch is under the straw. On the outside of this rectangular bottom the regular coiled work begins and the body is built up, the stitches all being concealed by what in this treatise is called imbricated ornament, or knife plaiting, carefully described and illustrated elsewhere. In this example the ornamentation

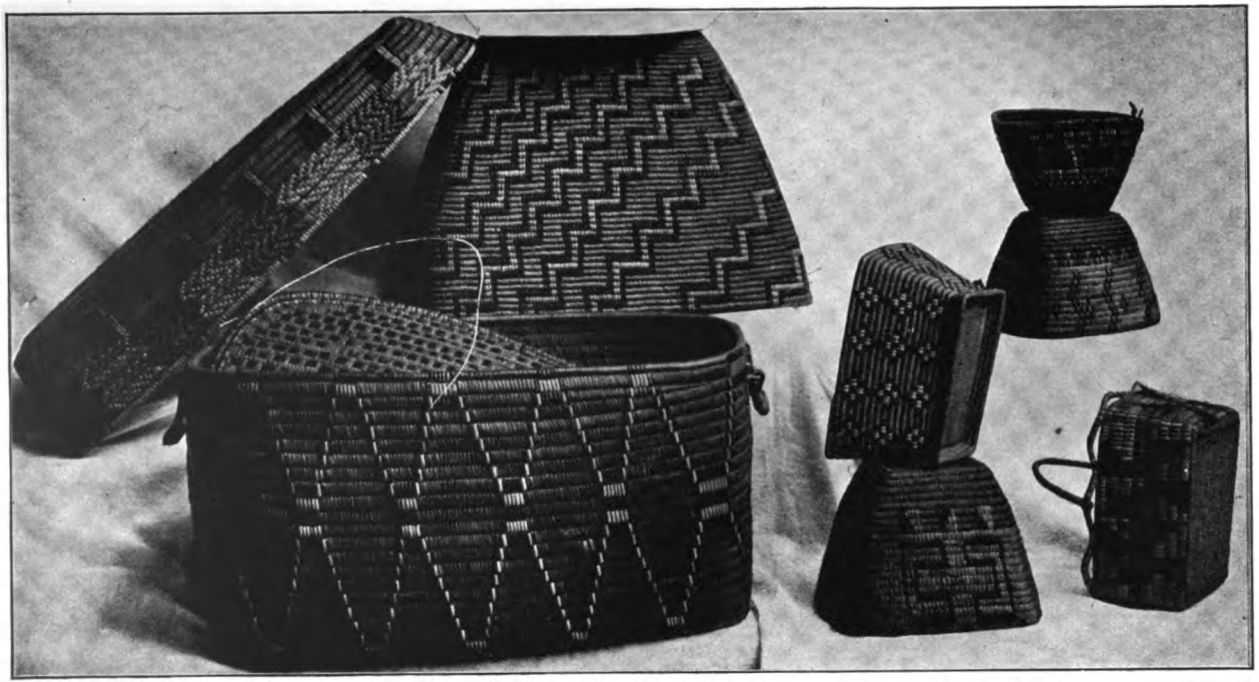


Plate 157. See page 344 COILED BASKETS IMBRICATED AND BEADED. THOMPSON AND FRASER RIVER TRIBES

Collection of Miss Anne M. Lang

is in squaw-grass, cherry bark and cedar bark dyed black. (See figs. 52–55.)

The foundation of the coiled work is not a single rod, but a bunch of splints made from the cedar root. Catalogue No. 60,235 in the United States National Museum was procured from Sitka Indians, Alaska, by J. J. McLean, to which place it had doubtless drifted in trade from the Fraser River region. Its length is 8½ inches and height 3¾ inches.

Mr. Hill-Tout reports that for boiling their food the N'tlaka pamuq tribe (Salishan family), on the Fraser and the Thompson rivers, always used basket kettles made like their other basketry, from the split roots of the cedar. These roots are sometimes red and black, and very beautiful patterns are made from the two different colours. The red dye was obtained from the bark of the alder tree, and the dark stain was obtained by soaking the roots* in black slime or mud, or from the root of a fern (Franz Boas).

Dr. G. M. Dawson, in his Notes on the Shushwap people of British Columbia, tells us that these baskets were made from roots of the spruce, and Dr. Boas, in his report on the Shushwaps, informs us that the basketry of the Shushwaps and N'tlaka pamuq was always made from the root of the cedar. As the N'tlaka pamuq were preëminent in basket-making, it is possible that the information gained by Mr. Hill-Tout may be accepted as correct, although the cedar (*Thuja*) is not abundant in the Thompson River country.† So skilfully did the women make these baskets that they would hold liquids without trouble. In preparing food, two kettles were used, one containing water for washing off any dirt that might adhere to the heated stones, and the other for holding the food. In boiling salmon for eating, the fish were tied up in birch bark to prevent breaking and falling to pieces.

* According to Dr. Boas, the black dye was obtained from the fern root. It is possible it was gotten in both ways

† Report of the British Association for the Advancement of Science, 1899, p. 511.

The Washington or southern imbricated ware is far more true to the old type than the northern, as will be seen. It may be divided between Salishan and Shahaptian. (Plate 158.)

The Klikitat or Shahaptian basket (Plate 158, fig. 2) is thus made: The foundation consists of the roots of young spruce and cedar trees. They are macerated and split or torn into shreds and soaked for a long time. The materials for the ornamentation are thus prepared. Most of it is of squaw-grass (*Xerophyllum tenax*). It grows on the east side of the Cascade Mountains, and can be gathered only during the late summer, when the snow has melted and the grass has matured. The broad leaves are split into the requisite width, and if they are to retain their natural colour are soaked in water only. To be dyed, they are soaked in mud and charcoal for black, in a dye from willow bark for brown, and a long time in water for yellow. In some cases, cedar bast is dyed black instead of the grass, but it is not so durable; or willow bark takes the place of the grass, but the surface shrivels. With the three elements of the structure around her, the Klikitat basketmaker takes a roll of root splints for the beginning of her foundation, which she wraps at one end for an inch with sewing splint. Doubling this, she begins her over-and-over sewing, splitting, sometimes with exquisite taste and care, the wood of the stitch underneath. The ornamentation covering more or less the surface of every Klikitat basket, called imbricated work, is laid on in the process of manufacture. The woman (1) catches the end of a strip of grass or bark under a stitch, (2) bends the strip forward to cover the stitch, (3) bends it back on itself, leaving about one-eighth of an inch for the next stitch to rest on, (4) makes her stitch, draws it home, and bends the grass strip over and covers it. It is a kind of knife plaiting held down by coiled sewing, and is an invention of this region.*

* Mrs. W. M. Molson, Basketry of the Pacific Coast, Portland, Oregon, 1896.

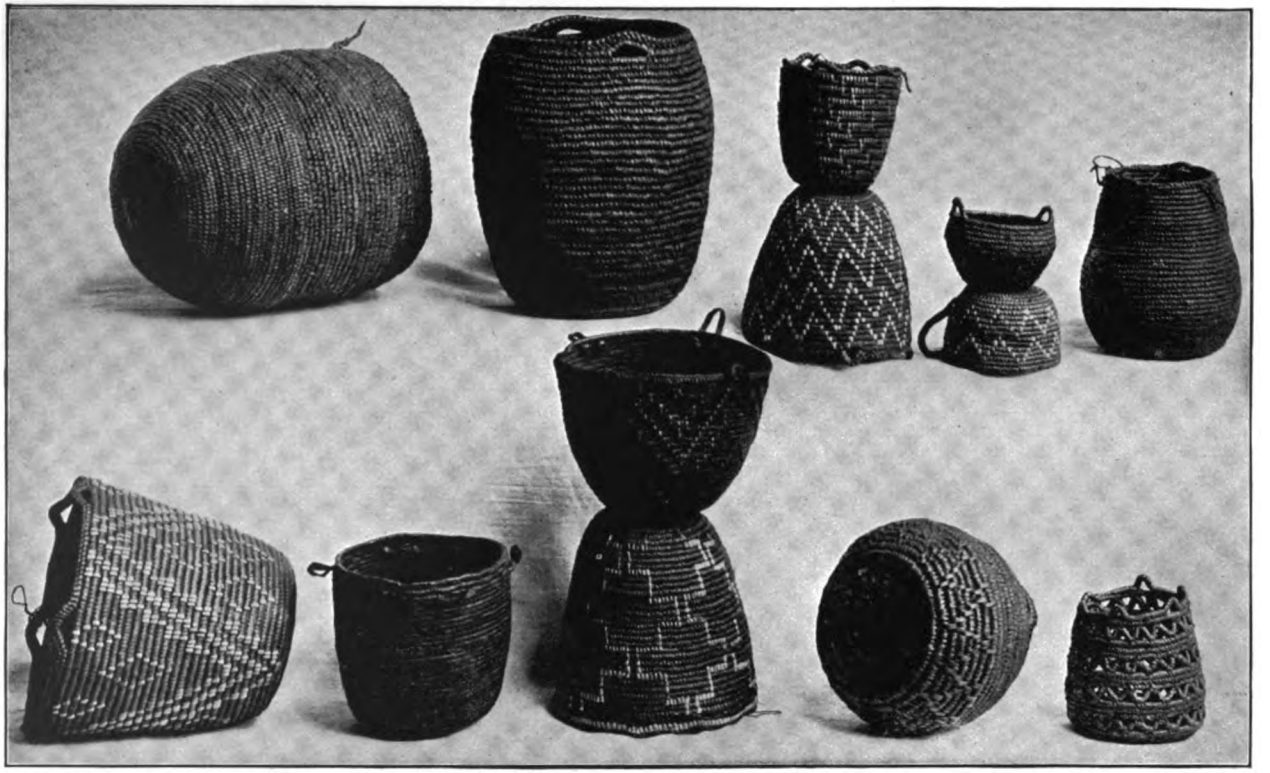


Plate 159. See page 348 OLD KLIKITAT BASKETS, SHOWING LITTLE IMBRICATION. WASHINGTON

Collection of Miss Anne M. Lang

Plate 158, fig. 1, is an example of the Salishan or older type on the coast of Washington. It is specimen No. 2,612, United States National Museum, collected by Captain Charles Wilkes.

The imbricated basketry of Washington is divided by Mrs. Molson into two classes, by districts. The eastern slope of the Cascade or Yakima district belongs to the arid plateau of eastern Washington, and the basket technic is heavy, staunch, and of good workmanship, though it shows the effect of climate. But the western or Cowlitz River district produced the perfect imbricated basket, with more coils to the inch, more stitches in the same space, and also more beautiful designs.

I am indebted to Mrs. Harriet K. McArthur for copies of the old records relating to the southern imbricated baskets. The most absolutely beautiful and perfect baskets of this type were made on Cowlitz and Lewis rivers in Washington. These places are but a short distance from Portland, over in Washington. No imbricated baskets were ever made south of the Columbia; the finest and best are from west of the Cascade Mountains. The shaping is more graceful, being woven much finer, and the designs are far more intricate. They rarely have the openings around the top for lacing strings. Beautiful ones come from the Skokomish Reservation and from the coast, but they may have reached these remote places through the medium of trade.

Immersion in water, charcoal, and bark dyes is practised. Cherry bark is employed much in British Columbia, and sometimes by the Klikitats, who occasionally put in willow bark, which shrinks and leaves an ugly stitch. The rare ones with colours—not the fine old brown, yellow, and black, but old rose and purple—are valuable because they are rare. The old rose is a berry stain, and the purple is from a root; but they will never rival the old brown in beauty.

The typical coiled and imbricated baskets from west Washington, therefore, may be called the Cowlitz type.

According to Dr. Boas, most of them are made on the Cowlitz River and north to Fraser River. He also bears witness that the split sewing and the interlocking of stitches are both practiced. The term Nisqually is also applied. The Athapascans seem to have dwelt originally in this area, and it is just possible that they carried the coiling everywhere.

The so-called Klikitat baskets are now found on the Yakima Reservation, in Klikitat and Cowlitz counties, along the Columbia River, in the vicinity of The Dalles.

Plate 159 represents old Klikitat baskets, coiled and little imbricated, in the collection of Miss Anne M. Lang, The Dalles, Oregon. At once the difference will be seen between these conical and quite aboriginal forms and those of rectangular shapes farther north in the Fraser and Thompson River countries. The method of ornamentation is the same, but the borders are finished off with considerable skill and taste in braided work. In the National Museum are photographs of excellent old pieces in the Harvey collection in Albuquerque. For the sake of comparison, Plate 160 is inserted to show later and more highly embellished forms.

The baskets made in imitation of a trunk are used for a similar purpose, and not for berries. The Hudson's Bay people and others brought camphor trunks from the Hawaiian Islands, taken there from China. The work is wonderfully good in this as well as in others. The interesting part is that the weavers before this time had made baskets with rounded bottoms, and began, of course, with the coil in the center; but the oblong shape with corners was another matter, so a thin board was covered with cloth to form the bottom, and on the edge of this the bone awl was used to make perforations to fasten the first row on this bottom. Later baskets had an ingeniously woven bottom over a number of narrow slats, and the patient weaver subsequently mastered an oblong coil.

From a report of the Commissioner of Indian Affairs, Governor Isaac L. Stevens, 1854, the following statements

Plate 160. See page 348

IMBRICATED KLIKITAT BASKETS, HIGHLY DECORATED, WASHINGTON

Collection of Miss Anne M. Lang

are taken in order to comprehend the migrations of the tribe after whom imbricated ware has been popularly named:

The tribes of the Klikitat and Yakima inhabit properly the valley lying between Mounts St. Helena and Adams, but they have spread over the districts belonging to other tribes, and a band of them is now located as far south as Umpqua.

The Klikitats and Yakimas in all essential peculiarities of character are identical and their intercourse is constant, but the former, though a mountain tribe, are more unsettled in their habits than their brethren. The fact is probably due in the first place to their having been driven from their homes many years ago by the Cayuses, with whom they were at war. They then became acquainted with other parts of the country, as well as with the advantages derived from trade. It was not, however, until about 1839 that they crossed the Columbia, when they overran the Willamette Valley, attracted by the game with which it abounded and which they destroyed in defiance of the weak and indolent Callapooyas. They still boast that they taught the latter tribe to ride and hunt. They manifest a peculiar aptitude for trading.

Under the term Walla Walla (page 223 of Stevens' report) are embraced a number of bands, living usually on the south side of the Columbia and on the Snake River, to a little east of the Palouse.

The Tai-tin-a-pam, a band of the Klikitats already mentioned, living near the head of the Cowlitz, were called by their eastern brethren wild or wood Indians.

From the report of the Commissioner of Indian Affairs for 1858 (page 225), Puget Sound Agency, T. Simmon, agent, is quoted:

There is a portion of the Indians of my district whose homes are high up on the river, principally on the Nisqually, Puyallup, and Snoqualmie. They are nearly related to the Yakimas and Klikitats by blood, and are sometimes called Klikitats.

R. S. Landsdale, agent, White Salmon Agency (page 275), writes:

Many of the Klikitats were removed during the late war from their former homes, west of the Cascade Mountains, to this agency.

The home of the Klikitat Indians, says Mrs. Molson,* was along the waters of the Columbia and its tributaries, from the Cascade Mountains on the west to the Bitter Root Range on the east, and from 46 degrees and 44 minutes North to what is now eastern Washington and northern Idaho. They were not only rovers and marauders, but they went on annual expeditions to trade, carrying dried buffalo meat and robes, and wild hemp, dried and twisted, to exchange for dried salmon and dentalia. They held the gateway between the East and the West, for the river was the only route of communication. South of the Columbia, along the ocean, is an old path known as the "Klikitat trail." They journeyed south by this route, and returned north by the Klamath trail on the eastern side of the Cascades.

Plate 161 is a typical coiled and imbricated berry basket of the Klikitat Indians, from the collection of Mrs. R. S. Shackelford, from whom the following information is received: The inside walls, both foundation and sewing, are from splints of the root of the giant cedar (*Thuja plicata*), collected on the sides of Mount Hood. The ornamentation is the imbricated work described in detail on page 346, the materials being of the white yi or squaw-grass. Cedar and cherry bark are also used, and for colour the yellow dye is procured from the Oregon grape (*Berberis nervosa*), the brown dye from alder bark, and the black from acorns soaked in mud. The meaning of the artistic terraced design is not known. Six months were consumed in making it. Catalogue No. 207,756, United States National Museum. The following story was gathered from a basketmaker by Mrs. Shackelford:

The Spirit told the first weaver to make a basket (tooksi). So she repaired to the forest and pondered over her mission. Gath-

* Basketry of the Pacific Coast, Portland, Oregon, 1896.

Plate 161. See page 350

IMBRICATED BASKET WITH OPEN BORDER, KLIKITAT INDIANS, WASHINGTON

Collections of U. S. National Museum

ering the plant yi, squaw-grass, elk-grass, pine-grass, and the red cedar roots, noo wi ash (*Thuja plicata*), she began to weave, and after many toilsome days a basket was produced. She carried it to the lake and dipped it full of water, but it leaked, and the Spirit said to her: "It will not do. Weave again a tight basket with a pattern on it." She sat by the water-side, and as she looked into the clear depths of the lake the pattern (chato timus) was revealed to her in the refracted lines, and with new courage she repaired to the depths of the forest and worked until she wrought a basket

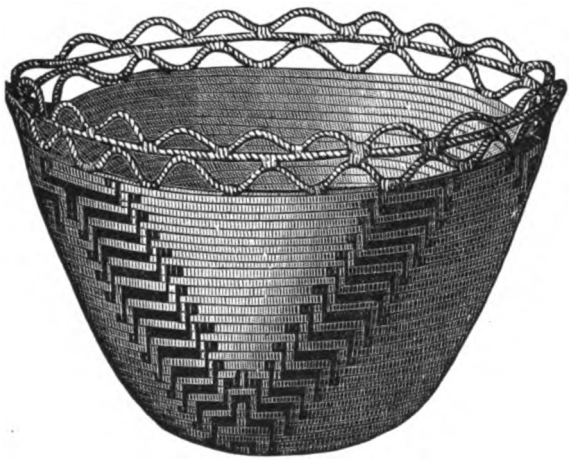


FIG. 156.
IMBRICATED BASKET.
Yakima Indians, Washington.
After W. H. Holmes.

on which the ripples of the lake were shown. Other women have learned the pattern all down the ages, but only very few are now left who can weave a faultless basket and a perfect imitation of chato timus.

The locality where the story was learned is Lummi Island, Bellingham Bay, Washington. The pattern referred to is similar to that shown in fig. 289 of the Sixth Annual Report of the Bureau of Ethnology.

Fig. 156 represents a fine old piece of Yakima coiled and imbricated basket, Catalogue No. 23,872 in the United States National Museum, collected by James H. Wilbur. The foun-

dation and sewing are in split root, probably cedar. The sewing is entirely overlaid and concealed by strips of squaw-grass laid on in the manner explained on page 346. The border is especially interesting, connected structurally with examples from California and Peru (see Plate 248). It is in open coiled work, the foundation being wrapped, bent in a regular sinuous pattern, and sewed down here and there. The design, according to Mrs. Judge Burke, represents a flock of geese migrating. Its height is 7½ inches. (See fig. 159 and Plate 35.)

FIG. 157.
IMBRICATED BASKET.
Cowlitz Indians.
Collected by Dr. J. L. Fox, U. S. Navy.

Fig. 157, Catalogue No. 2,137, is an old example of imbricated basketry from Washington, collected by Dr. J. L. Fox, United States Navy, of the Wilkes Exploring Expedition. Such work is now generally called Klikitat, and the Indians of that stock are expert in the use of it; but the exploring expedition did not come in contact with tribes so far in the interior. The Salish Indians on Puget Sound make the same type of work, and it is known that the very best come from the Cowlitz country, so that this is probably a very old piece of Cowlitz basketry in this kind of weaving. The whole surface is covered with imbrication, or knife plaiting, explained on page 346 and illustrated in figs. 52–54.

Catalogue No. 2,614, United States National Museum, shown in Plate 45, is an imbricated basket made by an Indian of Salishan family, in Washington. It is one of the oldest specimens in the National Museum, having been brought home by Captain Charles Wilkes more than sixty years ago. The material of the foundation and sewing is of cedar root.

The surface is covered entirely with imbricated ornamentation, the body colour being produced by strips of squaw-grass. The figures are in cedar bark in natural colour and dyed black by means of charcoal and mud. The golden colour in the straw filaments is produced by longer immersion in water. The most interesting feature in this basket is the bottom, which is

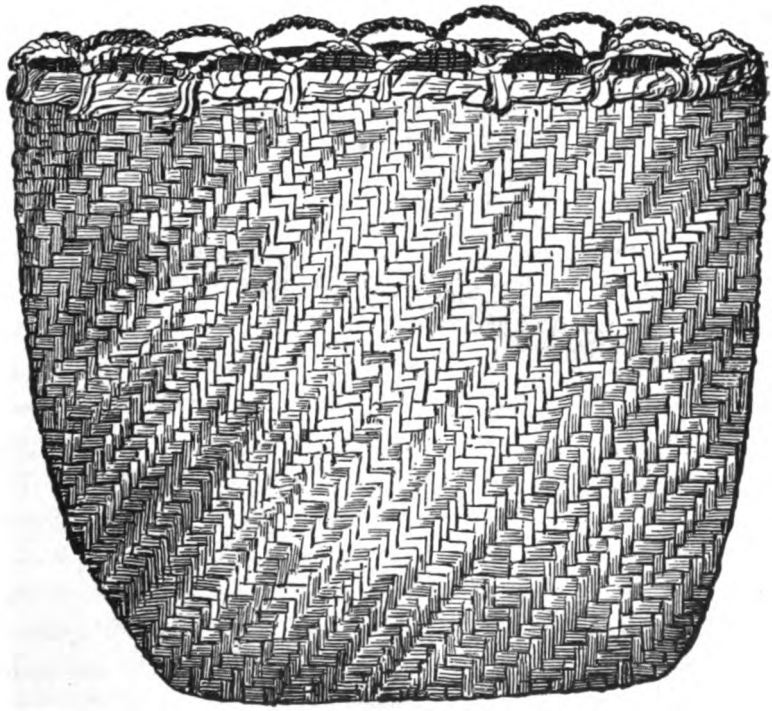


FIG. 158.
TWILLED BASKETWORK
Clallam Indians, Washington.
Collected by J. G. Swan.

formed upon a strip of wood three-fourths of an inch wide and six inches in length. It is very closely wrapped or served with a splint of root. Upon the margin of this the coiled work begins, one round being made in plain stitches. Afterward the patterns are attached immediately to this and extend outward to a black line on the margin, the body of the

basket being completely covered with other figures, the ends different from the sides. The border is neatly finished off in false braid. There are about eight rows of coiled work and from twelve to sixteen stitches to the inch. On the outside the stitches are regularly split or furcated. Length, 8 inches; depth, 4¼ inches.

Fig. 158 represents a specimen of twilled work by the Clallam Indians, and should be compared with Quilleute example, Plate 152. It is made of flat splints of white wood, resembling birch. The bottom was woven first, and all of the splints by being bent upward became the warp of the sides. Twilled effect is produced by passing each weft splint over two and under two warp splints. The fastening off of the upper border is done by bending down the warp splints and holding them in place by a whipping of the same material. The scallop on the upper border is formed by looping the middle of two splints under the rim, twisting both pairs of ends into a twine, passing one twine through the other, and doubling down to repeat the process until the whole is finished.

Illustrations of this method of making twilled work are shown in figs. 94–96, but, as will be seen, innumerable pleasing effects are produced by varying the colour, the number, the width, and the direction of the splints that are overlapped in the weaving. Catalogue No. 23,509, in the United States National Museum, was procured in Washington by James G. Swan. It is fifteen inches in height.

Myron Eells, long a resident among the Sound tribes of Salish, has collected for the United States National Museum at different times many specimens of their basketry. It was he that first noticed the great diversity that exists in such small tribes as the Twana, or Towanhoo. They use in their work a knife for splitting material, and a common awl, formerly of bone, in sewing their coiled ware. He has seen a woman using a small bone for pressing home her weft. This is rare, for the fingers are usually employed for this purpose.

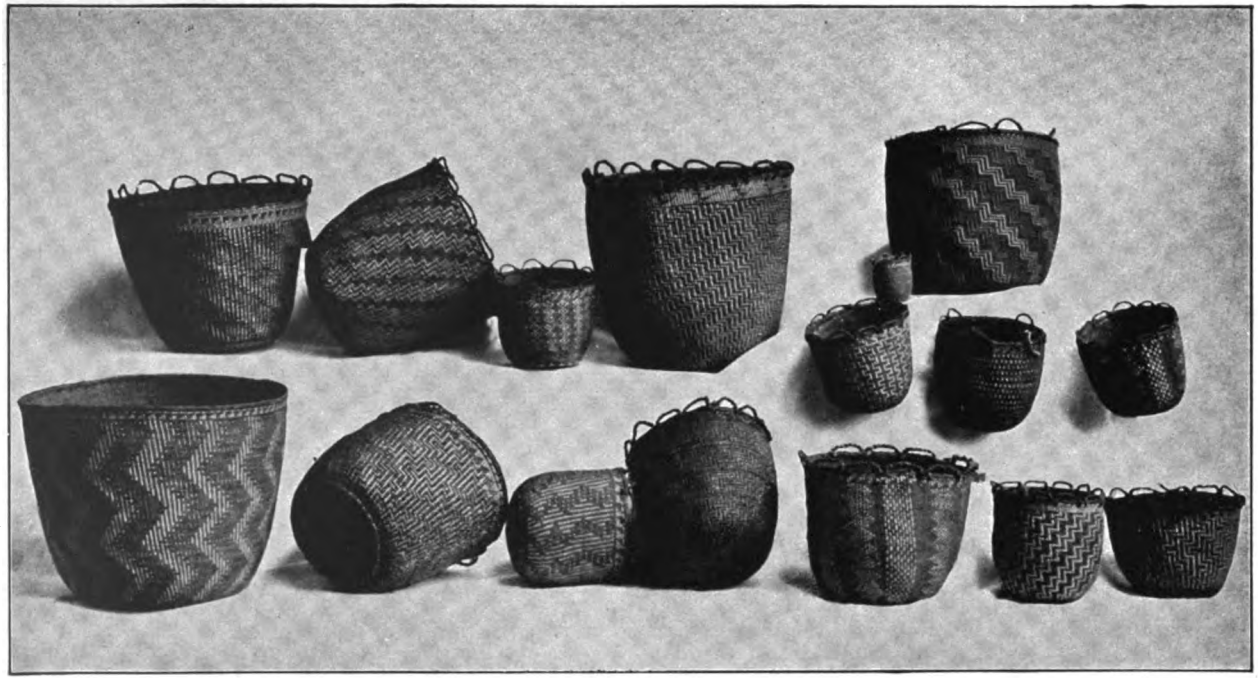


Plate 102. See page 357

TWINED AND OVERLAID QUINAIELT SALISH BASKETS

Collection of Miss Anne M. Lang

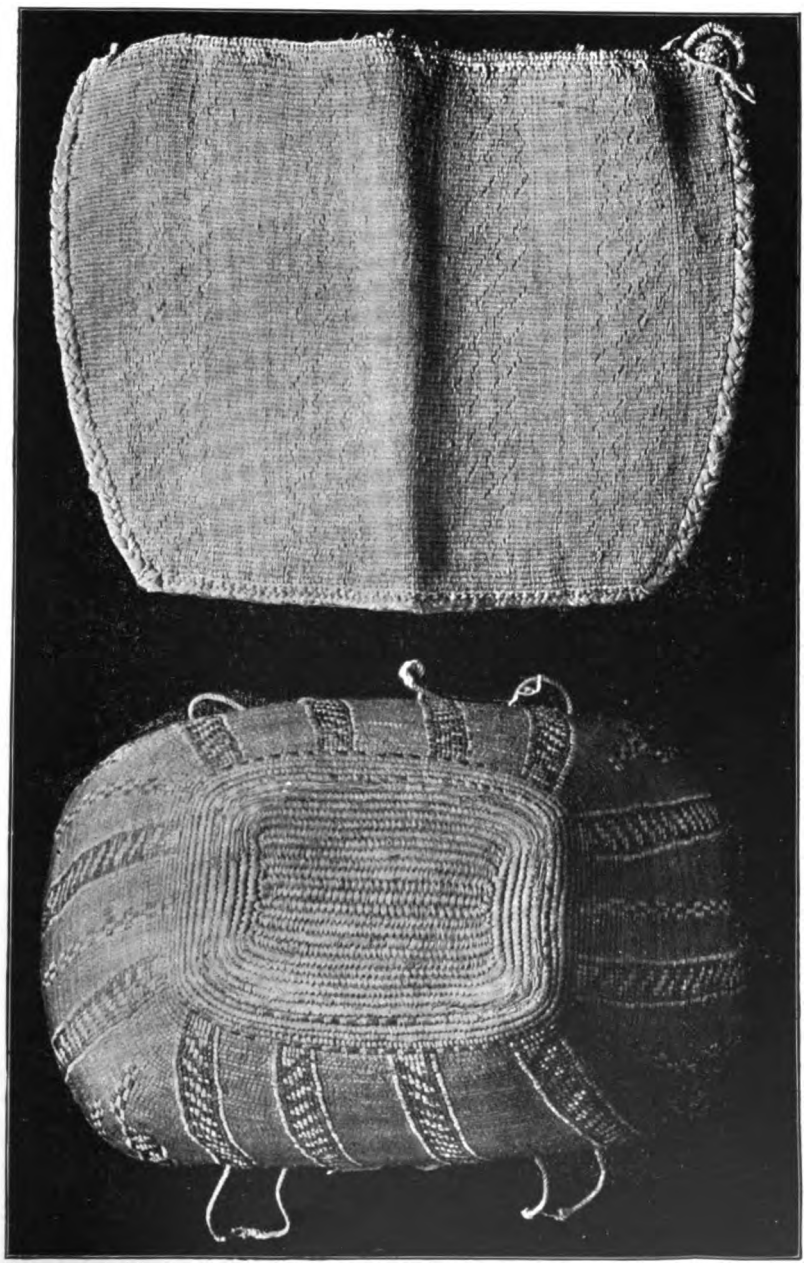


Plate 163. See page 357

TWINED AND IMBRICATED WORK, QUINAIELT AND THOMPSON RIVER
SHOWING DETAIL

Collections of U. S. National Museum

Fig. 159 is a water-tight basket for cooking, marked Clallam. The foundation is the single flat strip type. Attention is called to the ornamental effect produced in this work by the splitting of the under stitch by the one above it. The noteworthy feature of this type of basket, however, is in the occasional overlaying of a filament of squaw-grass or other material, which seems to be the first step toward imbrication. The

FIG. 159.
WATER-TIGHT BASKET.
Clallam Indians, Washington.
Collected by J. G. Swan.

grass lies over two stitches and is caught under the next stitch, passing under and over as in "beading." In other examples the straw is covered and revealed in the alternate stitches. It can be seen that a great variety of effects is possible in this manipulation.

A square inch from the surface of this specimen enlarged (fig. 160) will show more clearly what has been hitherto described—the interlocking stitches, the furcation of the stitches, and the overlaying with ornamental filaments.

Catalogue No. 23,512, in the United States National

Museum, was procured in Washington State by James G. Swan.

Charles Willoughby, who was agent among the Quinaielt or Quinault Indians in western Washington, makes the following report of their basketry:

"They have the cedar bark for the foundation of basketry, strips of pine root for rigid work, and hemp, rushes, and grass for the weft and ornamentation. The grass used in strengthening the borders of mats, rain cloaks, etc., grows on flat places. It is prepared like flax by soaking in water until the outer portion decays, when it is beaten with sticks until only the fiber remains. The yellow fiber of squaw-grass used by Indians for the outside of baskets is a great source of traffic, as it is only found in this locality. The basket grass is gathered carefully, one blade at a time, to secure that part of the stalk that reaches about six inches under the ground before it meets the root. To prepare the grass for drying, it is woven together at the ends with fibers of cedar bark. It is then spread upon the ground or roofs in the sun. When to be used, it is moistened with water and split with two small knife blades set in a stick in such a manner as to make the strips of the same width, the smaller portion being thrown away. The grass is kept moist with water while being made into baskets. The coloured grasses are now prepared by using aniline dyes. This was formerly done by steeping the roots of plants that yielded a yellow colouring. A red dye was made from the bark of alder, and a paint was made of blue clay." *

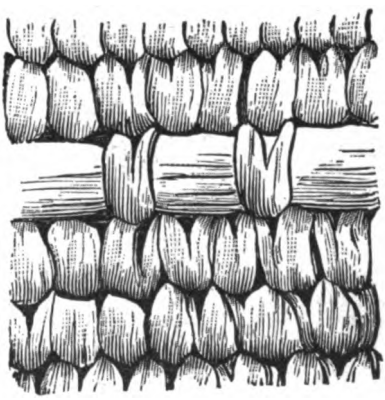


FIG. 160
DETAIL OF FIG. 159.

* Smithsonian Report, 1886, Pt. I, pp. 267–282.

Plate 104. See page 358

TWINED AND OVERLAID CARRYING WALLETS OF THE SKOKOMISH SALISH INDIANS, WASHINGTON

Collections of U. S. National Museum

Plate 162 shows a number of Quinaielt baskets in twined and overlaid weave, in the collection of Miss Anne M. Lang.

Plate 163, top figure, is a wallet made from grass stems by the Quinaielt Indians. It is worthy of special study, because the warp is horizontal and the weft vertical. Openwork figures are produced on the surface in a series of chevroned patterns by an ingenious but very simple process. At the point where the open effect is to be produced, the two strands constituting the twine do not make a half-turn, but pass above and below the warp, as in ordinary plain weaving, across one warp strand. In the next round the adjoining pair are similarly treated, and thus figures are produced. At the upper and lower margin two rows of horizontal twined weaving fasten off the ends, which are braided down. On the sides the warp strands are sewed into and concealed in a coarse braid of rushes. Width, 18½ inches; height, 14 inches.

Catalogue No. 151,452, in the United States National Museum, was collected in Washington State by Dr. Franz Boas.

Plate 163, bottom figure, is a Thompson River basket in the collection of J. W. Benham. It is introduced here for the purpose of showing how the Indian woman's mind struggled with the problem of starting the bottom of a rectangular coiled basket. It has been said that the Thompson River Indians do not understand this process, but many old Thompsons have coiled bottoms, and this technic is older than the other. The work begins by wrapping a foundation of splints with the split root of spruce or cedar for six or more inches. This is then doubled upon itself, and the sewing begins and proceeds backward and forward, as in plowing, until fifteen rows are made; the coiling then actually starts, the work extending not only along the sides, but across the ends, making a parallelogram, which is extended for ten rows farther outward, at which place the additional ornament begins. So far it is plain coiled work with split stitches; afterward it

becomes a mixture of plain coiled work with upright bands of imbrication. Its height is 13 inches, and its width at bottom is 9½ inches.

The twined baskets of Washington, with little animals around the margin, belong to the Skokomish and other Salishan tribes about Puget Sound. When the tails turn up, the figures are dogs or wolves; when they turn down, they are horses. Especial attention has been called to the varied and tasteful effects produced by the use of the rectangular element.

Plate 164 represents two carrying wallets of the Skokomish Indians living in Washington. The examples shown are done in the style of weaving called here "wrapped twine" (figs. 21 and 22).

Plate 165 shows specimens of carrying baskets made by Salish tribes in Washington; the one in the center is Tillamuk, Catalogue No. 151,149 in the United States National Museum, collected by Dr. Franz Boas. The others, Nos. 2,709 and 23,511, are very old specimens in the National Museum collection, and are credited to the Clallams. The upper one on the plate was brought by the Wilkes Exploring Expedition, secured more than sixty years ago. All of these are in plain, twined weaving with splint of root, probably spruce, made browner by soaking in mud. The ornamentation is false embroidery in squaw-grass. The three methods of forming the border are noteworthy. In the upper specimen, stout cable is formed by "sewing" a small bundle of root splints with the same material. This is sewed here and there to the upper margin of the wallet. The other figures show the margin finished by braiding down; the loops of root were twisted in subsequently. The animals on the margin are horses.

The specimen, Catalogue No. 23,511, which is the lower one on the plate, was collected in Washington by James G. Swan.

Plate 166, upper figure, is an open twined wallet of the Tillamuk Indians, Salishan family, the remnant of which is

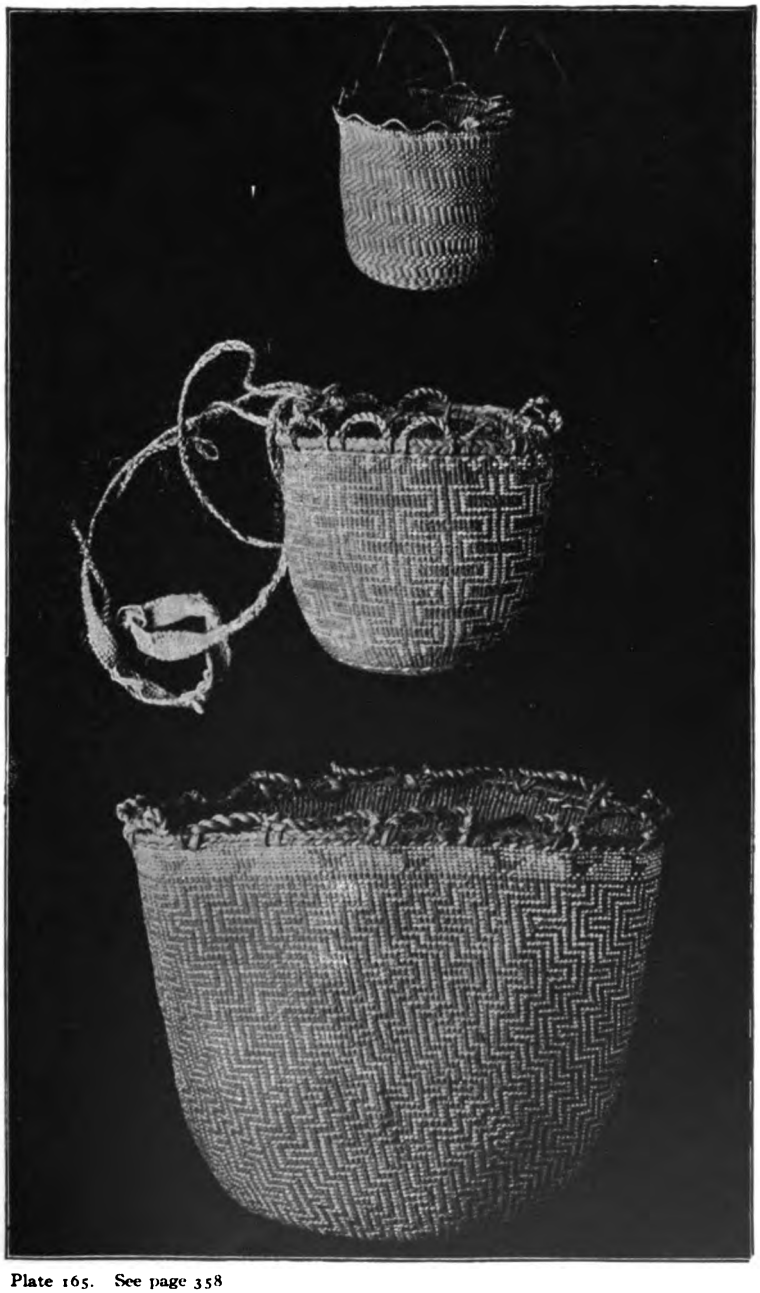


Plate 165. See page 358

TWINED WALLETS OF CLALLAM AND TILLAMUK SALISH, WASHINGTON

Collections of U. S. National Museum

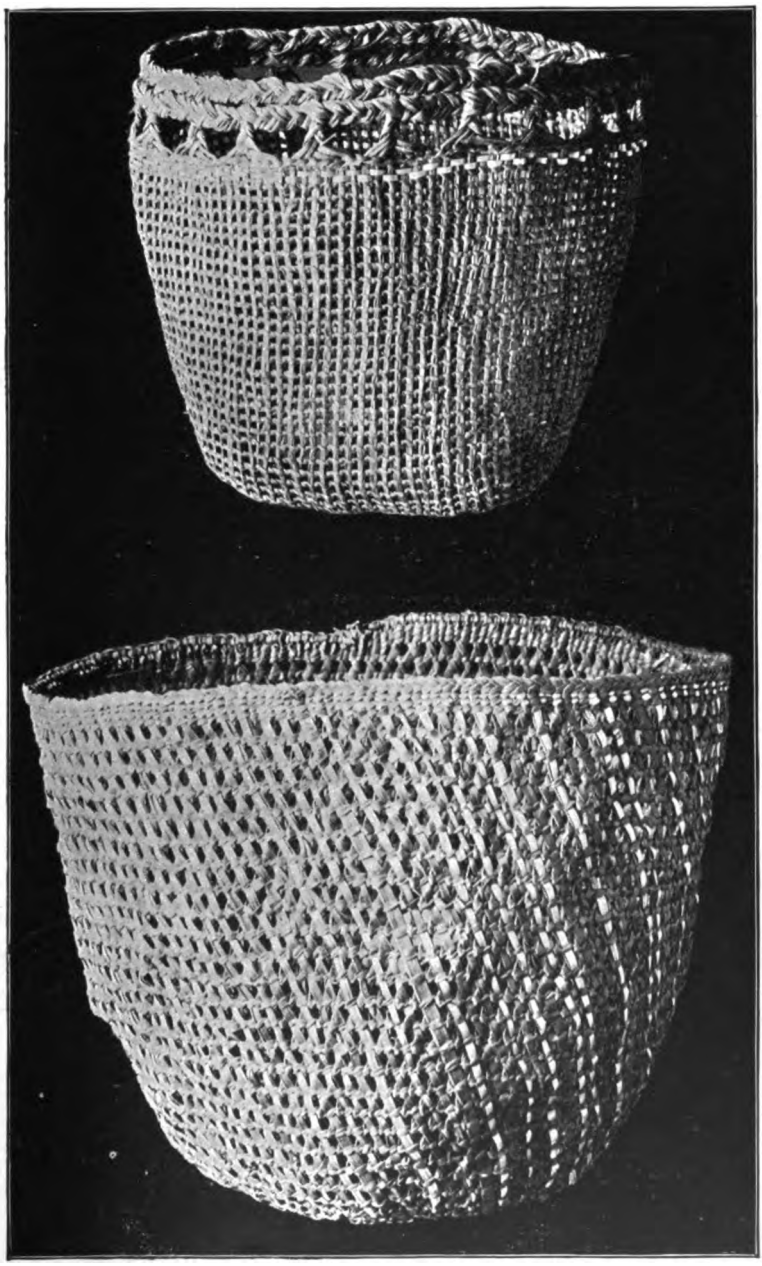


Plate 166. See page 358

OPENWORK TWINED WALLETS, CHINOOK AND TILLAMUK, WASHINGTON

Collections of U. S. National Museum

living at Grande Ronde Agency, Oregon. The bottom of this basket is rather ingenious. The warp splints of the sides pass across the bottom also, and are held together there by courses of twined weaving. At the edges of the end portions of the bottom the splints of the weft become the warp for the body. At the upper border two rows of squaw-grass are beaded in. The braided border around the top is formed by the ends of the warp splints plaited together in a double row, additional material being used if necessary.

The lower figure is an open wallet of the Chinook Indians, Chinookan family, occupying formerly both sides of the Columbia River from the mouth to the Dalles, a distance of 200 miles. According to Lewis and Clark, most of their villages were on the northern bank. To this family also belong the Clatsops and Wascos, to be mentioned later. The wallet illustrated in the plate is made of root in twined weaving with crossed warp. The bottom, or foundation, is a rectangular structure, about four inches square, made of double splints of root securely lashed together. From this central portion the splints spread out and the twined weaving begins. Additional warp elements are added from time to time as the structure widens. A coarse form of ornamentation is produced by overlaying some of the warp elements with squaw-grass. The fastening off of the upper border is peculiar, and on the outside imitates precisely a three-ply braid, but on the inside the structure is at once revealed. A strip of root is laid along the top of the warp elements, and these are brought over in button-hole stitch and tucked behind the strip, and then cut off, making a very rough appearance. It will be noticed that in the weaving of this wallet the half-turns of the twine do not go around the crossings of the warp elements, but just below, so as to include each warp separately. On the outside of the warp splints here and there a strip of grass is regularly overlaid.

Catalogue Nos. 151,447 and 151,448 in the United States National Museum were collected by Dr. Franz Boas.

The Nez Percé Indians of the Shahaptian family, prior to the advent of the whites on the Pacific coast, made heavy and beautiful blankets of the wool of the Rocky Mountain sheep and of the hair of animals killed in the chase, dyed in different colours. The patterns are all geometric, and are, in fact, woven mosaics, each figure being inserted separately by twisting two woof threads backward and forward around the warp strands. Scarcely ever does the twine extend in stripes all the way across the blanket in a direct line.

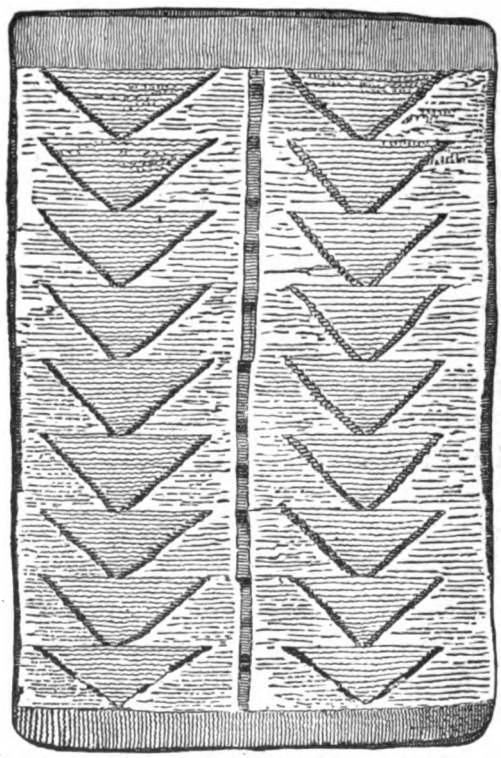


FIG. 161.
TWINED WALLET.
Nez Percé Indians, Idaho.

The same Indians at present weave bags from the bast of the Indian hemp (*Apocynum cannabinum*) and from grass stems shredded. The figures are produced by overlaying the regular warp strands with corn husks or coloured grass in false embroidery. In some examples (see fig. 161), the entire surface is covered with geometric figures; in others they are only partially covered. The Nez Percés are in the same family as the Klikitat and Yakima, but they make no imbricated baskets.

Fig. 161 is a twined wallet of the Nez Percés. The body

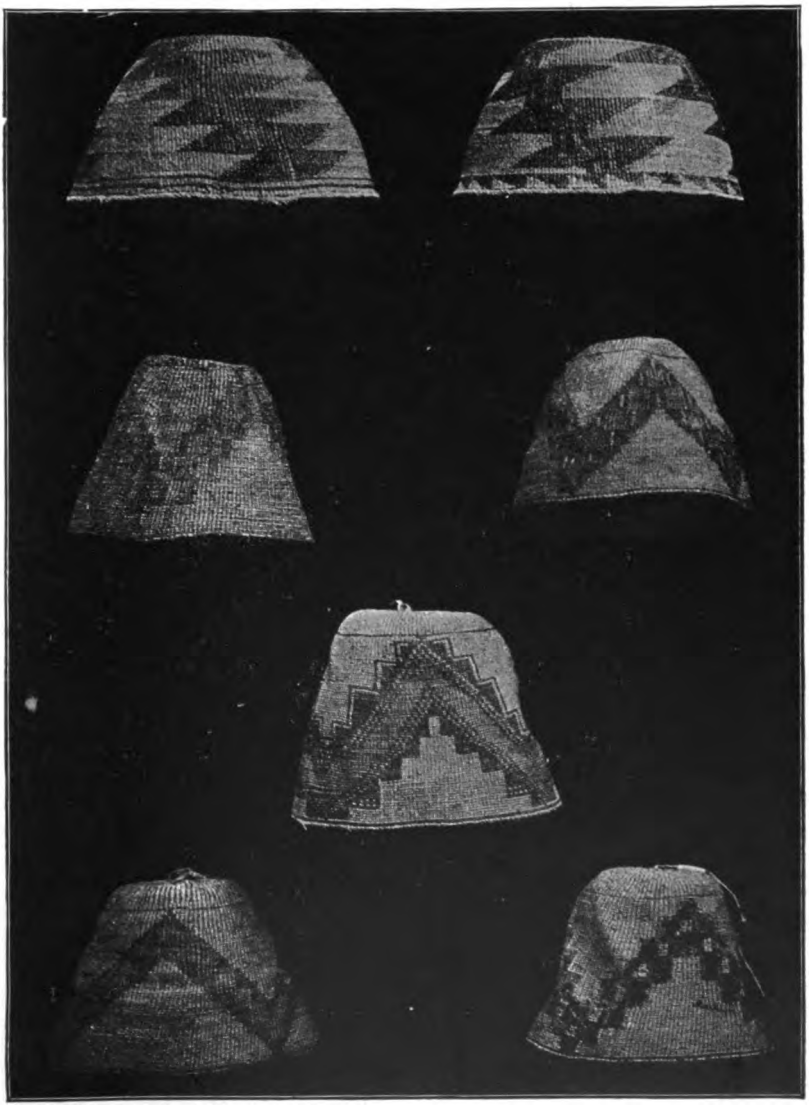


Plate 167. See page 361

WOMEN'S HATS IN TWINED BASKETRY. NEZ PERCÉ AND MODOC COMPARED

1 2
3 4
5
6 7

Collections of U. S. National Museum

weaving, both warp and weft, is of Indian hemp. In the process of manufacture a sufficient number of warp strands were joined together in the middle by a row of twined weaving and probably suspended, the ends hanging down. The weaver filled this warp with the ordinary twisted work, proceeding from the bottom to the border. The ornamentation, in corn husk or other weak material, in the natural colour or dyed, is laid on externally by what is here called false embroidery. The process was fully described and illustrated in speaking of Tlinkit weaving (fig. 139, page 323). This specimen should be compared with the making of soft wallets among the Fraser River tribes, illustrated in Teith's monograph, where the corn husk, instead of being wrapped merely around the outer element of the twine, passes around both strands, and the figure appears on the inside of the receptacle, which is not true of the Nez Percé example.

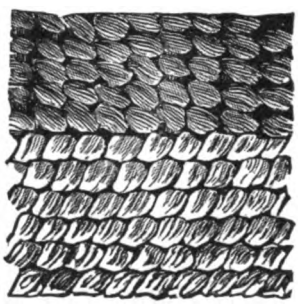


FIG. 162.
DETAIL OF FIG. 161.

Fig. 162 will show a square inch of this wallet, the special feature of which is that while the rows in plain twining seem to be vertical, they are inclined to the right in the false embroidery.

This specimen, Catalogue No. 9,026 in the United States National Museum, was collected in Idaho by Dr. Storrer.

Plate 167 is an interesting collection of women's hats. Figs. 1 and 2 are Modoc twined baskets from the Benjamin collection, Catalogue Nos. 204,258 and 204,259; height, 5¾ inches. The foundation is of rush. The weaving is in the same material, the designs being formed by regular overlaying in step patterns, formed by piling rhomboid figures upon one another. Strips of bird quill are introduced into these patterns, having been dyed a bright yellow which gives life to the figures. It may be repeated that both of these speci-

mens are in plain twined weaving overlaid. All the other figures on the plate are in wrapped twined weaving, as among the Makahs and other tribes of the Fraser-Columbia region.

Figs. 3 and 4 are women's hats of the Nez Percé and Walla Walla Indians, Shahaptian family, Washington, Catalogue Nos. 23,857 and 129,680. The foundation is of hemp. The weft consists of strands of hemp on the inside wrapped around with a filament of squaw-grass. The process of this weaving is explained in figs. 21 and 22. Catalogue No. 23,857, collected by J. B. Monteith, height 5 inches; 129,680, collected by Mrs. Anna McBean, height 5¾ inches.

Fig. 5, Catalogue No. 9,040, United States National Museum, is a woman's hat, called a wedding hat, and assigned to the Cascade Indians. It is doubtless Shahaptian. In every respect it is made like the Nez Percé examples described, being in wrapped twined weaving similar to that of the Makah Indians. Height, 6½ inches; collected by Dr. James T. Ghiselin.

Figs. 6 and 7, 5 inches in height, are women's hats of the Nez Percé Indians, Shahaptian family, collected by F. W. Clark, and No. 23,587, 5 inches in height, collected by J. B. Monteith.

The Cayuse (Waiilatpuan) and Umatilla (Shahaptian) make soft baskets in twined weaving. They are horse Indians and use their wallets for saddle bags. The materials are rushes, wild hemp, corn husks, and worsted. The bottoms and undecorated portions are plain twined work. In the figured parts the husks, split into narrow strips, are administered in four ways—by overlaying, not showing on the inside; by overlaying and twining so as to show on the inside; by false embroidery, wrapped about the weft twine elements on the outside; and by frapping the twined weft as in the Thompson River work (Mrs. McArthur).

The soft wallets illustrated in Plate 168, often called "Sally bags," were made by Wasco Indians, who belong to the Chinookan family. At present they are on the Warm Springs

Plate 168. See page 362

WASCO TWINED WALLETS. DESIGNS IN WRAPPED WEAVING

Collections of U. S. National Museum

Plate 169. See page 363

WASCO TWINED WALLETS, CALLED "SALLY BAGS"

Fred Harvey Collection

Reservation in Oregon and the Yakima Reservation in Washington. The wallet in the middle of the plate, No. 9,041, was presented to the United States National Museum by Dr. James T. Ghiselin, in 1869; the others were collected by Mrs. R. S. Shackelford and Miss E. T. Houtz. They are all made in plain twined weaving over warp of rushes, the patterns being effected by overlaying the twine of hemp with strips of fiber that in structure resemble corn husks. On the newer specimens the designs are clearly shown, representing man (tillacum), elk (mowitch), sturgeon (pish), duck (culla-culla). By observing the men's faces in the newer specimens it will be easy to detect the idealised faces on the fine old wallet in the middle.

Prof. O. M. Dalton figures* an old Wasco basket wallet, with the image of a man in knee-breeches on the surface. In the National Museum are a number of new wallets bearing this same figure, but the Dalton specimens show that it has been a motive in Wasco weaving for a long period.

Plate 169 represents twined wallets of the Wasco Indians, Oregon, in the Fred Harvey collection. The foundations are in native hemp in plain-twined weaving. On the body of the wallets, birds, beasts, and men are wrought in grass or husks of corn in corners.

Clatsops make flat mats and wallets of cattail rush. The latter, with strap of grass and wool across the shoulders, are excellent for carrying fish. They also construct a sack in open twined work in roots. The fine twined small baskets in three colours are equal to any in Oregon (Mrs. McArthur).

The California-Oregon Region

> The human hand is so beautifully formed, it has so fine a sensibility, that sensibility governs its motions so correctly, every effort of the will is answered so instantly, as if the hand were the seat of that will.—Sir Charles Bell.

The California-Oregon basketry region has only one definite boundary—the hard coast of the Pacific; on other sides there

* Man (London), I, note 17.

is no sharp ethnic limit. North, East, and South, it is full of turnstiles that move in one direction only. Tribes from far away pushed through them into this region, but if they had desired to turn their backs on abundant game, fish, and vegetal foods, they would have been prevented by the columns in the rear.

The ancient basketmakers of this area knew nearly every type and technical process of the art, both in weaving and coiling. They added at least one new technical process, the Tee weave. In ornamentation, imbrication is wanting as well as false embroidery, but there is quite enough else to make up the deficiency. Within the California-Oregon region there are subregions, and the following list of linguistic families will help to unravel the tangle:

NORTHERN GROUP

Athapascan family: Hupa, lower Trinity River, and Wailaki, western slopes of the Shasta Mountains.

Chimarikan family: On Trinity River.

Copehan family: Wintun under many names, western drainage Sacramento River.

Kalapooian family: The Willamette Plains, western Oregon.

Kulanapan family: Pomo, under many names, in Mendocino and Lake counties.

Kusan family: Coos River and Bay, western Oregon.

Lutuamian family: Klamath and Modoc, Upper Klamath River or Klamath Lake.

Palaihnihan family: Pit Rivers; on Pit River to eastern boundary of the State.

Pujunan family: Concow (Konkau), Maidu, Nockum (Nakum), western drainage of the Sacramento River, south of Palaihnihan.

Quoratean family: Ehnek, Karok, middle Klamath River.

Sastean family: Shastas; middle northern boundary of State.

Takilman family: Lower Rogue River, Oregon.

Weitspekan family: Yurok, weitspek, Lower Klamath River.

Wishoskan family: Wishosk, on Eel River and Humboldt Bay.

Yanan family: Nozis, north of Pujunan.

Yukian family: Ashochimi, Chumaya, Napa, Tatu or Potter Valley, Yuki or Round Valley, in Potter and Round valleys.*

SOUTHERN GROUP

Chumashan family: Santa Barbara, Santa Inez, San Luis Obispo, in Santa Barbara County.

Costanoan family: Mutsun; Pacific slope, west and south of San Francisco.

Esselenian family: Soledad, Eslen, and other missions close by on Monterey Bay.

Mariposan family: Yokut and many smaller tribes, Fresno River. (See Powell.†)

Moquelumnan family: Mu-wa and Olamentke divisions. (See Powell.†)

Salinan family: San Antonio, San Miguel, Monterey County.

Shoshonean family: Chemehuevi, Panamint and others intruded along the eastern border, more and more, from north to south, reaching the Pacific Ocean at the Santa Barbara Islands.

Yuman family: including Cochimi, Cocopas, Cuchan, Diegueños, Havasupai, Maricopa, Mohave, Waicuru, Walapai, and several missions.†

The locations of the linguistic families in California are shown on the map (see fig. 163). A glance indicates how, in a general way, the State is divided into northern and southern portions by a line running from San Francisco Bay to the angle of Nevada, and also in the same manner the subdivision of the northern portion of the State into three vertical sections. A little difference exists between the nomenclature of this map and that of Powell. For instance, the Wintun are Copehan; the Maidu are Pujunan; the Yokut on this map correspond to the Powell Mariposan. With these slight amendments the map will be easily understood and of great importance in locat-

* For classification of these northern tribes on the concept of basketry, consult Roland B. Dixon, Basketry Designs of the Indians of Northern California. Bulletin of the American Museum of Natural History, XVII, pp. 1–32.

† Seventh Annual Report of the Bureau of Ethnology, 1891, p. 1–142.

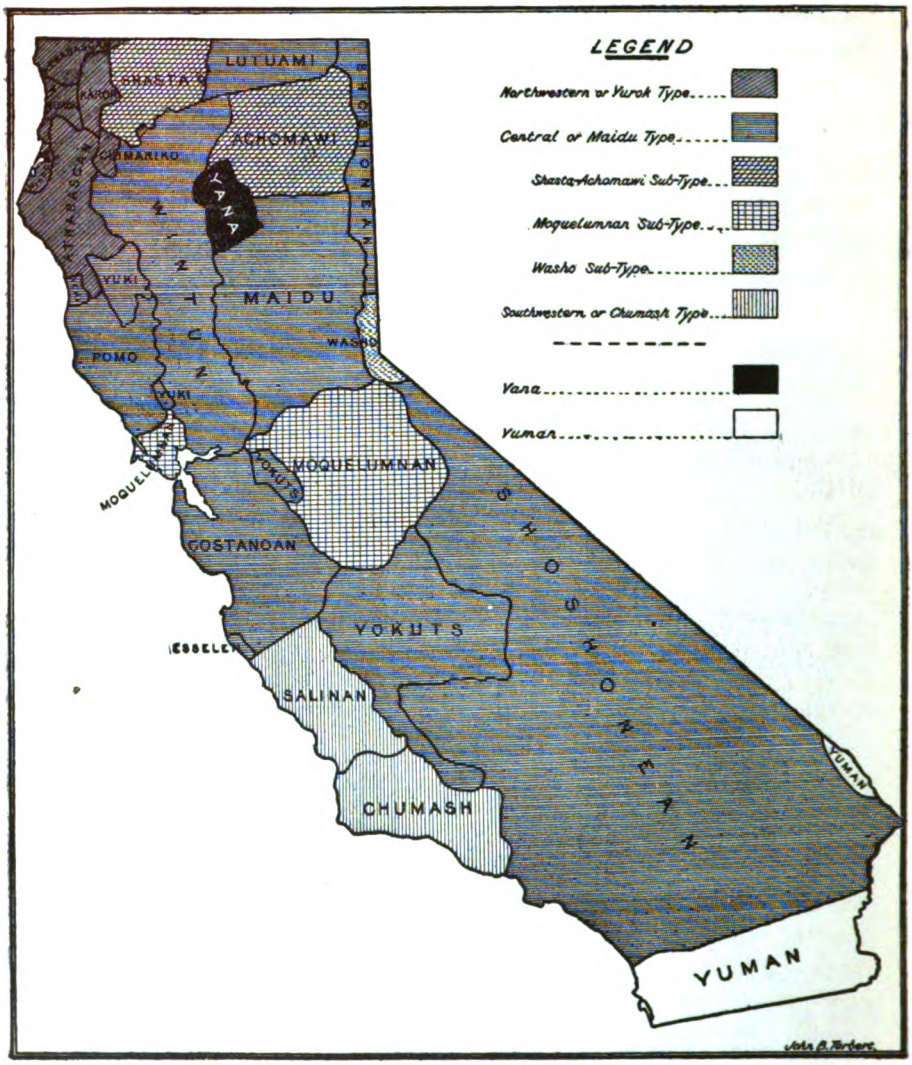


FIG. 163.
LINGUISTIC MAP OF CALIFORNIA.
After Dixon and Kroeber.

ing California basketry. It is interesting to note that, while the Powell map was made long ago from vocabularies only, the Dixon-Kroeber map is based on grammar, and yet the agreements are nearly complete. Especial attention is called to the

vast area occupied by the intruding Shoshonean family from the interior basin.*

The western division of the north California region, including the coast of Oregon as well, may be divided into three locations, each containing different tribes. The most northerly would be Athapascan and adjoining families; the middle division, those tribes associated in Round Valley; and the most southern of all, the Pomo.

The following list of plants carefully prepared by V. K. Chesnut, of the Department of Agriculture,† will apply to the Round Valley and Pomo basketry:

Acer macrophyllum, Pal gun sche (Yuki), maple. The Yukis of California use the bark for their basketry. The Puget Sound Indians employ it in their textiles, and Rothrock says that from the inner bark the tribes of the Pacific slope weave baskets, mats, and hats, waterproof.

Adiantum pedatum. The stems of maidenhair fern attain a length of 1 to 2 feet in the redwood belt of northern California, near the coast. They form the black strands in baskets, and especially basket hats.

Alnus rhombifolia, mountain alder, Un se (Yuki); Juskiat' and Kus (Wailaki); Gashet'i (Pomo). The fresh bark is used by the Yukis, as well as the Hupa and Klamath Indians of California, to colour their basket material.

Apocynum cannabinum, in Mendocino County, California, Indian hemp; Ma (Yuki); Po, in Concow; Masha (Little Lake); and Silimma (Yokaia) yields the common Indian fiber. The inner bark, collected in the fall, is soft and strong for thread, twine, ropes, and nets.

Asclepias eriocarpa, Go to la (Little Lakes); Bo ko (Concow); Machal and Chaak (Yuki), poisonous milkweed. The inner bark is used by the Eel River, Concow, Potter Valley, and Little Lake Indians for strings, nets, and other textiles.

* See Roland B. Dixon and Albert L. Kroeber, The Native Languages of California, American Anthropologist, V, 1903, pp. 1–26.

† Plants used by the Indians of Mendocino County, California. Contributions from the National Herbarium, VII, pp. 295–408, Washington, 1902.

Butneria occidentalis, Sai ka lé (Pomo), spice bush or calycanthus. Both the wood and the bark from fresh shoots are used in basketwork.

Carex, Tsu wish (Pomo), blackroot sedge. Used by the Pomo in their coiled basketry for decorating in black.

Carex sp. The long, tough rootstocks of several and perhaps most of the sedges (saw-grass) in Mendocino County, California, are used by the basketmakers. Great patience is exercised in tracing these from 2 to 5 feet through sand and mud and in preparing the splints. The baskets made from them are called "root baskets." Sedge rootstocks are the most important underground material, and the baskets made from them are the strongest, most durable, and most costly. Special characteristics belong to the different species.

Carex barbarae, Kahum (Pomo for water-tight baskets). The rootstocks furnish the splints for the white or creamy groundwork of most Pomo baskets. They are dug out with clam-shells and sticks aiding the hands and feet.* One end of the stock is grasped by the first and second toes, the clam-shell serves for scraping away the soil, and the stick for prying out stones and loosening the ground. A woman will secure 15 to 20 strands a day. They are placed in water overnight to preserve the flexibility and to soften the scaly bark, which is removed in the morning by the women. The end of the stick is chewed until the bark is separated. The wood is then held by the teeth, the other end of the stock is held taut by the first and second toes, and the bark is scraped away, leaving a tough white or tan-coloured strand about one-half the original thickness. These are done up in small coils and carried by the women to the camp. Mr. Coville draws attention to a bit of primitive agriculture in this connection. The Pomo women insist that the toughest and finest roots can be obtained only at certain spots. Unconsciously, they have been making this true by means of their digging sticks and clam-shells, during all the years loosening the ground and removing weeds.

Carex sp., Ta tet el (Wailaki), sea-grass or sedge. The roots and leaves used in basketry, especially for hats and cheap semi-flexible baskets.

Ceanothus integerrimus. The Concow squaws gather the young and flexible shoots of the California lilac, Hibi, for the warp of their baskets.

Cercis occidentalis. The bark and the wood from sprouts of

* J. W. Hudson, Overland Monthly, XXI, 1893, pp. 561–578.

the redbud, Cha-ba, in Yuki; Mula, in Little Lake; Kala-a-kala, in Yokaia; and Dop or Talk, in Concow, are used in finer baskets as foundation, as weft in twined ware, and as sewing-material in coiled work. The Indians produce a variety of results in *Cercis*. The stems are sometimes cut in winter and early spring to insure material for the next fall. The colour of the bark is then slightly red, which may be darkened by exposure to smoke and blackened by soaking in dirty water, in water and ashes, or in a decoction of oak bark to which scraps of iron have been added. The bark to be used in sewing coiled baskets is separated by steaming. In twined basketry some of the white wood is left adhering to the bark, in which case designs in two colours are produced, since the willow and carex are both much darker.

Corylus californica. The slender stems of the Hazelnut, Olman, in Yuki; Gom he ni, in Concow; Ch' ki, in Wailaki; Cha-ba, in Little Lake, are commonly used in place of willows in Round Valley for coarse sieves and fish traps and as warp in saw-grass baskets. A baby-carrying basket at Ukiah was made from the same material. The Calapooias make the finest openwork twined basketry of hazel sticks.

The Coos and Rogue River ware resembles the Shasta, the latter produce excellent work in hazel stems (Mrs. McArthur). (See Plates 4 and 172.)

Covillea tridentata, Tah sun up (Paiutes), creosote wood. It is one of the commonest industrial plants in southern California, Arizona, and southern Utah. The gum is used by the Apaches for cement. It is also used to produce a greenish-yellow dye. Owing to the odour emitted when heated, the plant is called creosote wood.

Gymnogramma triangularis, Gold-back fern. Common on open brushy hillsides throughout Mendocino County. As in the case of the five-fingered fern, this plant grows much more thriftily near the coast. The stems are also used there in the making of baskets.

Juncus effusus. The stalks of wire-grass, Lolum, in Yuki; Cha-ba, by the Potter Valley, Little Lake, and Yokaia Pomos; and Sito by the Wailaki, are used in Mendocino County for making temporary baskets. With them also children are initiated into the art of basket-making, and rackets used in gathering pinole seed as well as fish traps are woven.

Lonicera interrupta, Hai wat (Yuki), honeysuckle. The Yukis employ the flexible stems slightly for hoops in basket borders.

Philadelphus gordonianus, Ka kuss (Wailaki); Shon a hi (Little Lakes); Hawn li (Yukis), arrow-wood. A species of syringa or mock-orange. The pithy stems are valued on account of their lightness for the manufacture of baskets used by women for carrying babies.

Pinus sabiniana, Pol cum ol (Yuki), nut or digger pine. Used for basketry. The more pliable wood from the root is the chief source of material for making large V-shaped baskets, which Little Lake Indians use for carrying acorns. The root is warmed in hot, damp ashes, and the strands are split off before cooling. They are brittle when dry, but after being soaked in water they are easily manipulated in the more simply woven baskets. They are not sufficiently pliable, as sedge roots are, to be used like thread in wrapping round and round a horizontal withe.

Pseudotsuga mucronata. The smaller roots of the Douglas spruce, Nu, in Yuki language, are used in fine Pomo baskets. They are found in sections 8 to 10 feet long, uniform in thickness, and about the diameter of a lead pencil (quoting Hudson).

Pteridium aquilinum, Bis (Calpella Pomo); Bebi (Little Lakes); Sulala (Concows); Dos (Nomelakkis); Ma orda-git (Yokaias), the bracken fern. The hard wood is easily split into flat splints, which are sometimes used by the coast Indians for the black strands of their cheaper baskets. They are much less frequently used for this purpose by the Indians of Round Valley and Ukiah. Because susceptible of a fine polish, they are far weaker and more brittle than the saw-grass roots which compose the weft of their choicest baskets. The black colour is imparted by burying in mud.

Quercus lobata, Ky am (Yuki), white oak, acorn. The bark is used to a very slight extent by the Concows to blacken strands of the redbud for use in basketry. Rusty iron is added to the water extract of the bark to produce a black solution, in which the strands are allowed to remain for some time.

Rhus diversiloba. For dyeing the splints with which some Pomo baskets are sewed. Dr. Hudson is quoted as saying that an intense black is produced by applying to them the fresh juice of poison-oak in Pomo, Matuyaho; in Wailaki, Kots ta. The slender stems are also worked into the foundation of coiled basketry. *Rhus aromatica*, says Purdy, was formerly used by tribes eastward from Ukiah, as redbud is used by Pomos.

Salix argyrophylla. The silver-leaved willow, Bam Kal é, in Pomo; Kalalno, in Yokaia, is considered the best for coarse baskets.

It is common along Russian River, in California. It is not found at Round Valley, so these Indians would carry back small supplies of the slender stems when they returned from hop-picking near Ukiah. The roots are also highly valued in making certain baskets.

Scripus sp. The most valuable of the sedges for basket splints in Mendocino County is an unidentified species of the bulrush, *Scirpus* sp., Tsuwish, in Pomo. It is an article of commerce. Being rare near Ukiah, it is purchased at a cent a root from plants collected by Clear Lake Indians and in parts of Sonoma County or along the seacoast. The rootstocks, about one-fourth of an inch in diameter, consist of three distinct tissues—the outer, brown, like parchment; the middle; and the heart, a tough, woody structure. The outer surface of this woody tissue, which makes up the great bulk of the black fiber in the finest Pomo baskets, is slightly ribbed, and varies from light brown to nearly jet black. The interior is more or less white. Some of the dark splints are used just as they are, while others are blackened with the juice of poison-oak, *Rhus diversiloba*, or by burying them with charcoal, ashes, and earth for about eighty hours.

A detailed account of the manipulation of these rootstocks at Round Valley is given.*

Smilax californica, the only species of smilax in California, does not occur in Mendocino County, but is common along the headwaters of the Upper Sacramento. The fine, long trailing limbs are exceedingly strong, and are used to some extent in Round Valley and perhaps at Ukiah for basket-making. The Indians say that the strands have a brownish-black colour.

Tumion californicum. Splints from the roots of the California nutmeg, Kahe in the Yokaia language and Ko'-bi in Pomo, are said to be used by the Pomo in some of their fine baskets.

Vitis californica. She in (Pomo); Mot mo mam (Yuki); Kop (Numlaki); wild grape. The native wild grape of the region climbs over trees in canyons and in damp places to a height of thirty feet or more. The smaller, woody parts of the vine are extremely flexible, and are very considerably used by the tribes for the rims of their large carrying baskets. It is gathered at almost any time, soaked in water and hot ashes, after which the bark is removed and the wood split into a couple of strands, which, although very coarse, are used substantially as thread. The tribes of California make ropes and various household articles from the vine.

* Plants used by the Indians of Mendocino, California, p. 317.

As a connecting link between the Salish and other basketry north of the Klamath River and the true California types, there is here shown the figure of an old piece of basketry brought from Oregon more than sixty years ago (fig. 164). It is the ordinary coiled weave of the west coast, covered with red and white feathers. The latter are caught by their stems under the stitches as the work progresses, just as in the Pomo and other California tribes of to-day. It is interesting to find this type of work so far north. It points to the fact that many of the gaps which occur in this study could have been easily

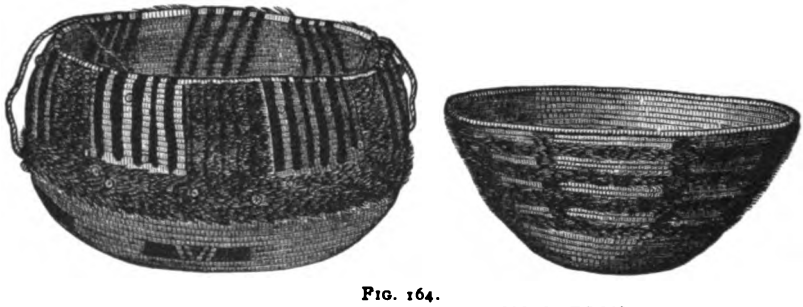


FIG. 164.
OLD FEATHERED BASKETS FROM OREGON.
Collected by Dr. J. L. Fox, U. S. Navy.

filled when the Indians were in their native situations. Holmes has other figures in the same type of basketry, only the feather work is combined with the ornamentation in the weaving on the surface. Attention is called again to the fact that the imbricated ware stopped short at the Columbia River. In it the plaits of grass or bark overlie one another just as feathers do in this feather work, and the stem of the feather is doubled under the stitches in the same way. To be especially noted are the groups of vertical stripes on the margin and the chevroned design at the bottom. Whether there was genetic relationship between the two remains to be studied out. The specimen Catalogue No. 2,138 in the United States National Museum was collected by Dr. J. L. Fox, United States Navy, of the Wilkes Exploring Expedition.

The Pacific slope branch of the Athapascan family is found in the northwestern corner of California and far northward into Oregon. The Hupa Reservation in 1864 was made to include a number of bands scattered around Trinity River, the names of which may be found in the Smithsonian Report for 1886, Part I. As late as 1850 the Hupa are said to have lived in pristine simplicity. Autumn supplied the all-important acorn, large quantities of which were collected and kept in store for use during the winter and spring. The vegetable food is gathered chiefly by the women. The outfit of the primitive gleaner, miller, and cook was principally in basketwork. While no edible root or food was despised, the oak furnished the chief breadstuff. The acorns were gathered in an osier hamper about 16 inches high and 20 inches in diameter, made in twined weaving. It was used by the women in carrying loads, supported by a band across the forehead. Filled with acorns, this hamper was placed on the back and held in position by means of a carrying pad, consisting of a disk of mat 5 by 4 inches. About the middle of October the Indians beat the acorns from the trees with long poles and carry them home in these baskets. The squaws remove the hull by giving it a slight tap with a pestle. The nuts are then dried and beaten to powder in a mill having a basket hopper. The flour is soaked in a hollow scooped in the sand, cooked into a kind of mush in baskets by means of hot stones, and baked into bread.

If the harvest was of seeds instead of acorns, they were winnowed in another basket of close twined weaving which the good woman had not failed to decorate with graceful patterns, following that unconquerable artistic instinct which is the heritage of all the peoples who breathe the air of the Pacific Ocean. Under the heading of uses, a multitude of functions for the Hupa basket will be described in detail.*

* The Ray Collection from Hupa Valley, Smithsonian Report, 1886, pp. 205–239.

Dr. W. L. Jepson has determined for Dr P E. Goddard the materials used by Hupa in baskets. The burden basket, the baby basket, and the salmon plate are made entirely of the shoots of hazel, *Corylus rostrata* var. *californica*, Hupa name mûk-kai-kit-loi. These shoots form the foundation or warp of all other basketry except the finest hats and the covered bottles. For these, shoots of willow are used, of which *Salix sessilifolia* and *S. fluviatilis* var. *argyrophylla* are indicated. These willows are not common in Hupa Valley. The warp stems, while slimmer than those from the hazel, are said not to be so durable. They are fastened at the commencement of the basket and at the beginning of the body by rounds twined with the root of certain deciduous trees. This material is called indiscriminately "kût." The roots of the more common willow, as well as the two mentioned, are used, besides the root of *Alnus oregana*, *Vitis californica*, and *Populus trichocarpa*. The principal weft of all close-woven baskets is composed of the root of *Coniferæ*. Of the trees growing in or near the Hupa reservation, the roots of *Pinus ponderosa*, *P. sabiniana*, and *P. lambertiana* are used. The selection of the species and of the individual trees depends on their readiness to split properly. These roots are roasted in the ground. Besides these, the Hupa import, from the coast, material from *Sequoia sempervirens* and *Picea sitchensis*. These root materials are called "xai." The root of the wild grape, *Vitis californica*, is used in place of the coniferous roots in fine hats for the woof. For decorative work the leaves of *Xerophyllum tenax* serve for white, and the stems of *Adiantum pedatum* for black. A reddish-brown is obtained by dyeing the inner part of the stem of *Woodwardia tradicans* with the bark of *Alnus oregana*. The primitive method of dyeing was to chew the bark and draw the splint through the mouth just before introducing it into the woof. The alder dye is now sometimes applied by steeping in a dish, but the results are said to be not so certain. Yellow is obtained by dipping the leaves

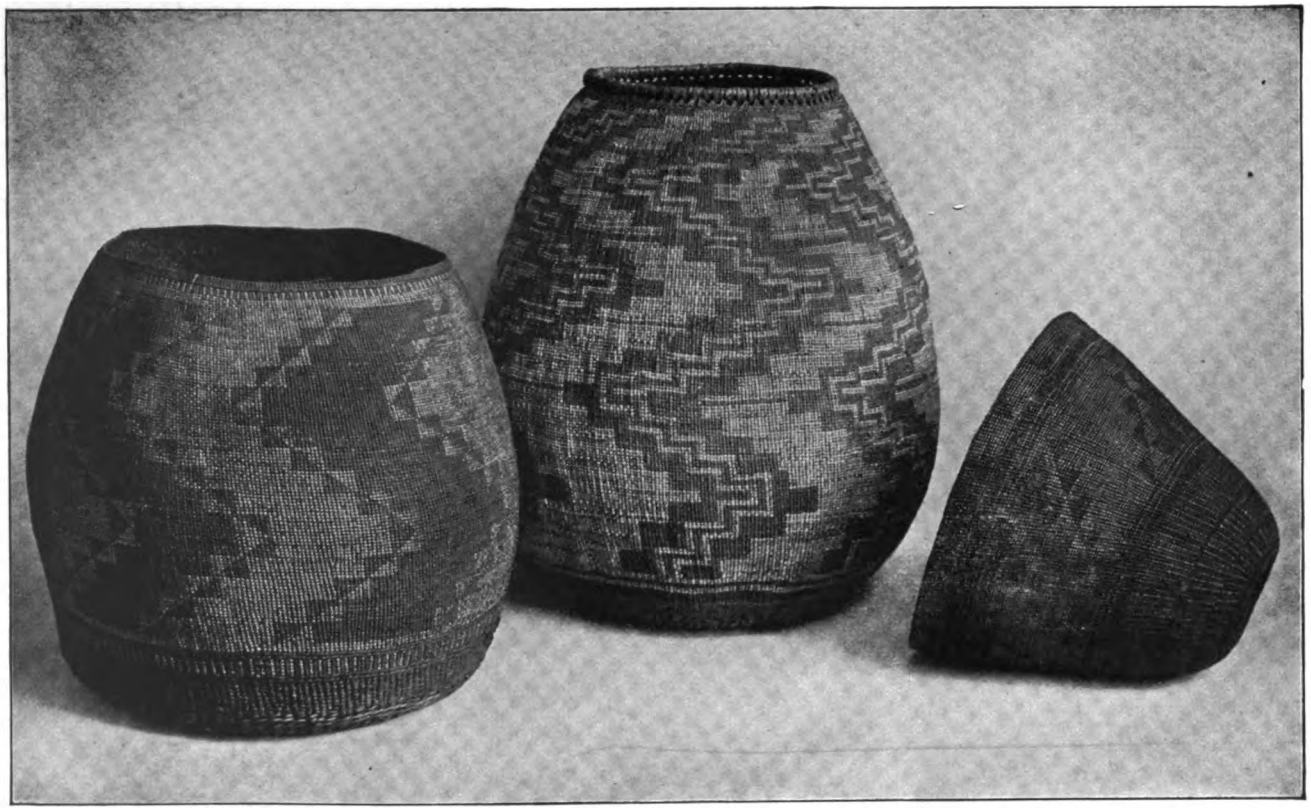


Plate 170. See page 375

HUPA GRANARY BASKETS, TWINED AND OVERLAID

Fred Harvey Collection

Plate 171. See page 376 SHASTA INDIAN BASKET-MAKER IN THE MIDST OF HER WORK

Photographed by John Daggett

of *Xerophyllum tenax* into a decoction of *Evernia vulpina*. The setting of this dye is difficult, and many women do not use the yellow in basket-making. Porcupine quills are dyed with this lichen, giving a brighter effect. Their use is not common. A few women are now employing the Oregon grape for dyeing the Xerophyllum leaves. Baskets are sometimes collected for Hupa work which are made by the Tolowa, in Del Norte County. These have a steel-gray colour obtained by dyeing the root of the tideland spruce with rusty iron. The root and iron are buried in the damp ground for some time.*

Plate 170 represents three granary baskets of the Hupa Indians in the Harvey collection. The figure shown on the right is used as a cover for the granary. These baskets furnish excellent examples of form and decoration, as well as technical processes, among this Athapascan group. It has been mentioned before that we have here an example of acculturation through women of an art created by the conservative sex. If a number of Hupa men of Athapascan stock broke into this area and took to themselves wives of the country, the weaving processes would not be changed, so that in any one of these baskets will be found, beginning at the bottom, three-strand twined weaving; above that, two-strand plain twined weaving, and over the surface, decoration in overlaying. On the granary baskets the triangular and rectangular elementary forms are worked into vertical stripes, the basis of which is the bent line, or zigzag, forming the ornamentation, while the leaves of grass alternate with the foundation colour by laying a strip of the former on the latter and exposing it or turning it under at will. Dr. Goddard, in his paper published by the University of California, gives the following symbolism:

* Goddard, Pliny Earle, The Life and Culture of the Hupa. Publications of the University of California. American Archæology and Ethnology, I, No. 1, 88 pp., 30 pls., September, 1903; also No. 2, Hupa Texts, 290 pp., March, 1904.

The isosceles triangle the Hupa calls "rattlesnake's nose" (Lūwminchūw); right-angled triangles made with a horizontal line meeting a vertical line are called "sharp and slanting" (ches-Linalwiltchwel). Oblique-angled parallelograms are very frequently used. The name given them is "set on top of one another" (niLkutdasaan). Another design, which lacks beauty on account of its jagged appearance, is called "grizzly bear his hand" (mikyowe mila). Another figure is called "frog his hand" (ttchwa mila). A third design has angles projecting upward with the vertical lines on the outside of the figure and the oblique lines sloping inward and downward. This pattern is called "swallow's tail" (teshechmikye) or "points sticking up" (chaxcheuñeL).

When the isosceles triangles (called Lūwminchūw) are grouped one above another they are called Lūwminchūw niLkutdasaan ("snake's nose piled up"). When these figures come back to back so as to form diamonds alternating with the background, they are called Lokyomenkonch ("sturgeon's back"). When the figure apex is superimposed on a trapezoid the name cha is given to the design. These figures are nearly always so connected as to encircle the basket, when the name LenaLdauw is given to it, signifying "it encircles." A design which seems to be the trapezoids superimposed is called LekyuwineL ("they come together.") The conception of the design seems to be that of the second variety of triangles back to back. A series of rectangular parallelograms superimposed so that each higher one projects to the right of the one below it, the whole being bordered by a double line conforming to the outline, is called kowitselminat ("worm goes round" or "worm's stairway"). The oblique-angled parallelograms in pairs, with the upper one at the right, are the designs most frequently found on the hats. They are found in series on the storage baskets (djelo). Usually even numbers are employed, preserving the symmetry of the zone. Designs in red often have horizontal lines in black. Oblique lines in white often run across the design. When such lines run through the oblique-angled parallelogram they are called niLkutdasaan mikiteweso ("one-on-the-other its scratches").

In his monograph on Hupa Texts, Doctor Goddard gives the Formula of Medicine for making baskets.

Plate 171 represents a Shasta basketmaker in northern California, wearing one of the beautiful twined basket hats,

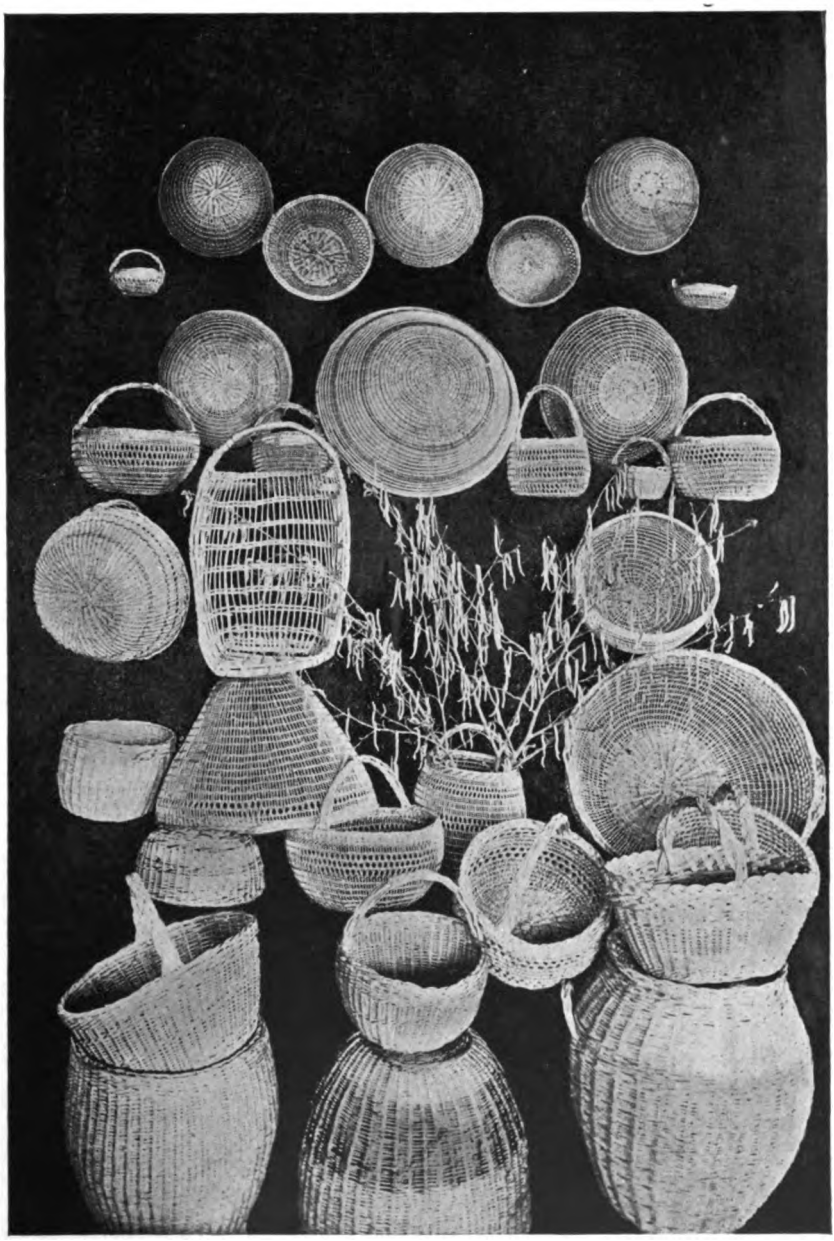


Plate 172. See page 377

BASKETS MADE FROM HAZEL STEMS

Collection of Mrs. Harriet K. McArthur

so called among this tribe. She also has about her, as a garment, a deerskin decorated with long fringes of false braid in straw, the work done in a single strand.

From Governor Daggett comes the information that the California Indians about him make the frame of the coiled baskets of hazel twigs skinned (*Corylus californica*). The weaving is done with split pine root. The ornamental patterns are produced by sour-grass, maidenhair fern and bird quills obtained in trade. The white splint is dyed by being chewed in the woman's mouth together with alder bark, thus making a kind of animated vat of herself. For the conical carrying basket, the Shasta Indian name is as tim num. Papoose basket, locks too; soup cooking basket, sal am poki; soup eating basket, pas tarrum; large storehouse, sip nook; cover to same, ash roos; mortar basket with hole in bottom, kraam num; acorn sifter, a flat disk, ten na bra; acorn bowl, moo roch.

Mrs. Harriet K. McArthur has in her collection also a large number of Shasta, Rogue River, and Calapooia baskets, made in open twined work from stems of the hazel. (See Plate 172.)

South of the Hupa Indians is the Round Valley Reservation with the following-named tribes: Concow (Pujunan); Little Lakes (Kulanapan); Redwoods and Yukies (Yukian); Wailakis (Copehan); Pit Rivers (Palaihnihan), and the Nomelakis (Copehan or Wintun family). A moment's thought will show why it is that varieties in basket types come from this reservation. The Indian tribes of the neighbourhood are mixed with those of the Sacramento Valley and Maidu or Pujunan people east of the Sierras. With biological mixture there has been corresponding fertilisation of ideas.

N. J. Purcell, for a long time agent among the Round Valley Indians, describes the gathering basket as coarse meshed and roughly constructed. He has sent to the National Museum an example made by the Little Lake tribe. It is woven of sticks with the bark on, and is very quickly made. It has a buckskin string attached about the center, by which

it is carried. It is used for gathering acorns, nuts, grain, etc. When filled, this basket is emptied into a large carrying basket, this being repeated until the larger basket is full.

The large carrying basket is always put in some convenient place and a smaller one is used in gathering nuts or grain. Several of the other tribes there use the same basket, though it seems to have originated among the Little Lake Indians. The willow of which it is composed is of the ordinary kind which is seen along nearly all the creeks in the East, and is equally plentiful here.

The sticks are generally used while green, though they are frequently gathered in quantities, allowed to dry, then soaked in water as they are required for use.

The carrying sack is made like an ordinary hunting bag and about the size. It is manufactured by the Concow Indians only. The buckskin string attached is thrown across the shoulder, allowing the sack to swing by the side, as we carry the hunting bag. The material of which it is made is from a weedlike plant that grows from three to five feet high, found in but one place in this country. At the foot of Black Butte, about 7,000 feet above sea level, it grows in great quantities. This plant, bo-coak, bears a large white flower, which is filled with seed and has quite an agreeable odour. The leaves are large and long, tapering at the points. In winter the stalks die and become hard and dry, and are gathered in great quantities by the Indians. The bark is carefully taken off and the material from which the twine is made is stripped from the inside of the bark. This is as white as cotton and seems much superior in strength. In making his twine, the Indian seats himself, after first removing his trousers, takes enough of this flax to twist into about the size of No. 10 cotton in his left hand, lays it across the fleshy part of his right leg, licks the palm of his right hand, places it upon the flax, and twists it. In this way they make twine of all sizes, from that of the coarse sewing thread to that of a half-inch rope.

In early times all the sewing they did was with this thread, using a sharpened bone for a needle. The larger size twine was for making fish nets, bird nets, carrying sacks, snaring deer, etc.

The mortar basket is used for pounding acorns, grain, all kinds of nuts, and seeds. It is made of tough roots of the fir, which are usually gathered in spring or winter, when the ground is soft. Roots of the small saplings are preferred, being tougher than those of the old tree. The size of the roots gathered varies from one-half to one and a half inches. These are buried under hot ashes and are allowed to remain thus for an hour. They are then taken out, not burned, but very hot. This steaming process toughens them and makes them split more easily, besides seasoning them to some extent. The squaw takes this hot root in both hands, seizes it near the end with her front teeth, throws her head back and her hands forward, and the root is split exactly in the center in less than half a minute.

The two halves are again split in like manner, and so on until the pieces are about twice as large as required. The craftswoman is now more careful, and the last piece is sometimes started with a sharp rock or knife, but usually with the teeth. One end of the splint is caught in the right hand, the other being kept between the teeth. The thumb and forefinger of the left hand are clinched tightly on the stick below the mouth. The head and right hand are now pulled slowly from each other. As the operation proceeds, the finger and thumb of the left hand are slowly slipped down in front of the split part. Thus this last piece is divided accurately in the middle. The splints are not used at once, but are tied up in large circular coils and allowed to season, which, however, does not take long, as they are thin and the heating process hastens the operation. Being now prepared to make a basket, the woman uncoils the splints and throws them into a pan or basket of water, which renders them pliable and easy to be worked. The ribs of the basket are willow switches with the

bark scraped off. In beginning the basket, two of the splints are taken from the water and attached to one of the ribs with a kind of wrapped knot, so fastened as to allow one splint to stand toward the weaver and one directly from her. Another rib is now set close to the first one, and the splints are reversed—that is, the outside one is pulled toward the weaver and the inside one is put from her; this forms a half-turn around each side of a rib, the splints crossing or twining between the ribs. The same weave is used in the construction of the whole basket. Around the extreme top of this basket is a half-inch stick, usually wrapped or stitched on with small vines split in the center. The dark red material used occasionally in this basket (*Cercis occidentalis*) is found in the mountains, and is an undergrowth never attaining a size larger than one's ankle. The Indians call it "mo-lay." It bears a red blossom and small, slender switches, which are of a dark red colour, which grow up at the bottom of the larger bush. These are split open in the middle in the same way as the fir root, save that they are not heated. The stitches represent half the size of the stick, as it is split only once. The wood with bark off is snow white.

Mr. Purcell, in describing a pretty little basket of grass root covered with red feathers, made by the Little Lake Indians, says every mother in this tribe presents one of these baskets to her child when it is about seven years of age, with the admonition to take care of the gift. They have a superstition that if the basket is lost some evil will befall the child. It is impossible to obtain one of these from the Little Lakes, the specimen mentioned having been secured in the Concow tribe.

Under the name of Pomo are included a great number of tribes or little bands, thirty, according to Hudson, Purdy, and Wilcomb—sometimes one in a valley, sometimes more—clustered in the region where the headwaters of the Eel and Russian rivers interlace, along the latter and around the estuaries of the coast. In disposition the Pomo are quite differ-

ent from the Yuki and their congeners, being simple, friendly, peaceable, and inoffensive. They are also much less cunning and avaricious and less quickly imitative of the whites than the lively tribes on the Klamath, to whom they are inferior in intellect. As to their physique, there prevail on the Russian River essentially the same types as that seen in the Sacramento Valley. When first occupied by the European, the valleys inhabited by the Pomo teemed with wild grasses and the streams were hedged in with carex and willow. The native grasses have almost disappeared, while the carices have given place in the lowlands to hops and alfalfa. Many ranchers forbid an Indian to dig on their lands, thus limiting the weaving-material supply to outlying canyons or compelling a substitution of inferior quality. Sometimes an indifferent worker will use but one character of material in a basket; for instance, the redbud shoots for warp and the two contrasting sides of the cortex for pattern. This method, called bi-to'-i, effects looseness of weft and warp, incongruity of colours, and instability of the vessel, and is strongly condemned by an expert. Some weavers will conscientiously refuse to work rather than substitute hai (woody material) for ma-yem' (roots). The following notes by J. W. Hudson accompanied his collection to the National Museum:

Vegetal materials for Pomo basketry

Indian name.	Scientific name.	Common name.	Parts used.
Ka-hum'.....	*Carex barbaræ*.....	California sedge.....	Prepared root.
Tsu-wish'.....	*Carex*.....	Black-rooted sedge	Dyed root.
Shi-kŏ'.....	*Salix sitchensis*.....	Sitka willow.....	Prepared root.
Bĭm.....	*Salix sessifolia*.....	Hinds's willow.....	Prepared stems.
Ma-ló-ma-ló.....	*Salix nigra*.....	.....	Prepared inner bark.
Ka-ll'-she.....	*Pinus sabiniana*.....	Nut pine.....	Split root.
Ka-wă'.....	*Pseudotsuga taxifolia*...	Douglas spruce.....	Root.
Bis.....	*Pteridium aquilinum*...	Brake or bracken.....	Prepared root.
Mu-lé.....	*Cercis occidentalis*.....	Redbud.....	Bark of shoots.
Pshû-bă'.....	*Corylus californica*.....	Beaked hazel.....	Stems.
Băm-tú.....	*Vitis californica*.....	Grape.....	Vine.
Ma-shă'.....	*Linum californicum*....	California flax.....	Prepared stems.

Wilcomb finds black designs sewed in tule root and fern roots also.

Animal materials for Pomo basketry

Indian name.	Scientific name.	Common name.	Parts used.
Ká-ya	*Saxidomus gracilis*		Prepared shell.
Ká-ya	*Cardium corbis*		Prepared shell.
Tĕm	*Haliotis*		Prepared shell.
Ka-tăts′	*Melanerpes formicivorus*	Woodpecker	Throat and scalp feathers
Ju-shlī′	*Sturnella magna*	Meadow lark	Breast feathers.
Chi-ká-ka	*Lophortyx californicus*	Crested quail	Crest.
Ka-yán′	*Anas boschus*	Mallard	Scalp feathers.
Tsă-wá-lû	*Cyanura stelleri*	California jay	Neck feathers.
Ba-chí-a	*Colaptes cafer*	Mexican woodpecker	Quill splittings.
Shaí-i	*Aquila chrysaetos*	Golden eagle	Tail and pinions.
Tsu-lí-a	*Agelaius gubernador*	Tricoloured blackbird	Elbow feathers.
Kai-yó-o	*Icterus bullockii*	Bullock's oriole	Neck and breast.
Pŏ *	*Magnesite*	Magnesite	Burned, prepared cylinders.

* Mineral.

Ka-hum′ is split into strings or flat splints and kept wet during the process of construction. Colour, light tan or white. Used in sewing coiled basketry.

Tsu-wish′ is buried in ashes for about eighty hours, thus dyeing to shades of black; then split into splints like Ka-hum′.

Shi-kó, split into splints. Whole stems are used for fish weirs; colour, cream.

Bam. 1. Young shoots decorticated and polished for foundation of coiled basketry; colour, straw.

2. Splittings from bark of young shoots.

3. Splittings of young shoots.

Ma-lo-ma-lo. Inner bark strips; colour, dark tan.

Ka-li-she. Split root; colour, buff.

Ka-wa. Split root, trimmed limbs; colour, gray

Bis. Chewed and cleansed root, split; colour, black.

Mu-lé. Bark of shoots, split into tape with a bit of wood adhering; colour, burnt sienna. Used in sewing coiled basketry.

Pshu-ba. Trimmed stems.

Bam-tu. Vine, used rough or decorticated.

Ma-sha. Crushed, hackled, and combed.

Ka-ya. Manufactured from clam-shells; current among the Indians as "Indian silver." Monetic base.

Plate 173. See page 383

UNFINISHED POMO BASKET, IN TEE WEAVE, SHOWING TECHNIC

Collections of U. S. National Museum

Po. Magnesite, mined in Lake County, California. Heated dull red, then tempered in hot water. Knapped and scoured into cylinders.

Bored. Current as Indian gold. Monetic base.

All prepared vegetals turn dark with age, and especially by the smoke from the open fires in Indian huts.

Tsu-wish ranks first in value; a bunch equals 100 Ka-ya. A bunch of Ka-hum′ equals 65 Ka-ya; Mu-le, 20 Ka-ya.

Plate 173 illustrates a coiled basket of the Pomo Indians left unfinished to show the workmanship. The foundation is in the style called Tee weaving, twined work, described and illustrated on page 77 and in fig. 27. These structural features are clearly set forth in the plate. In the foreground the vertical and the horizontal warp, as well as the twined weft, appear in their true association. The body sewing is done with white splints of me lé or redbud (*Cercis occidentalis*); the figures, representing mountains, are wrought with brown splints of cercis. It is ten inches in diameter, collected by J. W. Hudson, and is Catalogue No. 200,013 in the United States National Museum.

In feather work, each feather is plucked from the prepared skin of the bird and neatly caught under a stitch, which is then drawn tight. They are used either to heighten the colour without aiding the design or the design is in the feathers and not in the stitches. For the former, quail plumes and the red feathers from the woodpecker's head are employed. The red feathers are placed regularly but thinly on the stitches of the upper half of the basket, and the quail plumes scattered, or below three rows of shell disks (kaia) on the upper edge of the basket. In the feather basket proper there are two varieties called "tapica" and "epica." The tapica is the so-called sun basket; but Purdy insists that the word means "red basket." The oldest specimens are saucer-shaped, covered with red feathers, decorated with pendants of kaia and abalone and with circles of shell money. The use of other feathers than

red is a charming innovation. The Ballo kai Pomo name for feather baskets in any other shape is "epica." When the Pomo use shell disks (kaia) to decorate coiled basketry, a thread is carried along under the stitches and the disks threaded on as needed. Beads are usually applied in the same way, but in some examples they are threaded on the sewing filaments. (Carl Purdy.)

There is no more interesting group of Indians in America than the Pomo with respect to the variety of technical processes in basketry. They not only understand many of the proc sses common among other tribes, but have introduced one or two types of manipulation peculiar to themselves. The following classification, prepared by J. W. Hudson and Carl Purdy, shows the variety of basketwork made by them:

TWINED WORK (TSHAMA)

1. Pshukan (Shakan, Purdy), coarse twined work of shuba or hazel.
2. Pshutsin, wrapped weft, happily called backstitching by Hudson.
3. Bamtush, plain twined weaving.
4. Shuset, twine over two warp rods, twilled.
5. Sheetsin, three-strand braid or twine.
6. Lit, Makah style, wrapped weft twined (figs. 20, 21).
7. Tee, twined weaving over lattice foundation.

COILED WORK (SHIBU)

8. Shailo, foundation of splints.
9. Tsai, foundation of one rod.
10. Baumko, two-stem foundation laid vertically.
11. Bamshibu, foundation of three rods.
12. Bamteck, four-stem foundation.
13. Tsawam, the half-hitch work on cradles.

Purdy adds ringed and sewed; each circle of foundation complete. These names are from Yokaia, Upper Yokaia, Calpella, and Potter Valley. The word for basket in Potter

is Pika; at Upper Lake, Sitol; at Lower Lake, Kolob; at Cache Creek, Kawah.

1. Pshû-kăn′ (fish weir) in its simplest form is the binding of a row of upright warp rods by means of pairs of hazel or willow shoots, passing them horizontally with a half twist in each space. Undressed material is the rule, but in more delicate household vessels the wood is decorticated, even polished. Hazel (Shu ba, the fisherman) was the original material. It is nothing more than a very coarse open twined work, passing now and then into three-strand twine. (See fig. 20.)

2. Pshutsin, a very substantial means of framing a large, heavy structure, such as granaries, sheathing for thatch, game fences, etc. It is in effect wrapped twined weaving, seen also in Mohave carrying frames and Andaman baskets. From the periphery a strand of grapevine loosely encircles two ribs, passing to the left over four ribs, then backward, catching two or more and repeating gradually, back two, forward four, inward to the center or apex. A second vine catches a rib at the bottom of the roof, passing to the left over four ribs, encircling two, thence zigzags parallel with No. 1 to the top. This is repeated till spaces are covered. Pshutsin effects in house building a coarse mesh at the foundation, but gradually closed in at the apex, where most needed. In granaries and cages the conditions are reversed, but the effect is the same. Fences require an additional top vine. (See fig. 13.)

3. Bamtush (Bamtu, grapevine), plain twined weaving. Coloured patterns and esthetic art were here born, the brown bark of the vine contrasting with the pale yellow of the inner vine splittings. The grape has long since been discarded for stronger and more polished material. Bamtush is the strongest weave, and is used in carrying baskets, acorn baskets, and very large, heavy mush baskets. There is a warp of willow or other stems radiating from the bottom. On this the weft is laid in pairs, the two splints being twisted a half turn in

passing a warp stem. The effect is that of ribbed cloth or corduroy. The ornamentation is usually in bands. (See fig. 15.)

4. Shuset is twining over two warps and alternating from round to round, and affords the amplest opportunity for artistic display. It is called twilled twined work, and its surface is the smoothest of Pomo leaves; the patterns are bold and clear and cover the whole area. It is the only weave whose designs are not woven through. It has also the mode of delicate structure. It is used in large acorn baskets, also in mush baskets, being strong, smooth, and moderately close. Some fine gift baskets are also in this weave, and it seems to be susceptible of much more elaborate ornamentation than the plain twined work. The word Shuset, says Hudson, is understood only as far south as Ukiah City, the Yokaia term for diagonal twine being Bam tsai. (See fig. 20.)

5. Sheetsin is a style of three-strand twined weaving in which at each third of a turn one weft filament is carried behind a warp stem. It will be seen at once that when the bundle of weft filaments has made a whole revolution, each one of them will have been carried behind the warp. On the inside, this basketry does not differ in appearance from common twined weaving, but on the outside each weft element passes over three warp stems and under one.

There is a peculiar type of Sheetsin used chiefly to start the foundations of twined baskets. It is a three-strand weft in which a braid is formed instead of a twine, one of its elements passing over each warp, the other two remaining outside. On the inside the effect is that of plain twined weaving, while on the outside the effect is diagonal. (See fig. 28.)

6. Lit is a style of twined weaving in which one of the elements remains on the inside of the basket and the other is wrapped around the checks formed by the crossing of this horizontal element with the vertical warps. The Makah Indians of Cape Flattery employ this technic almost exclu-

sively, but Hudson says the Kulanapan tribes used it only to give variety to a surface in which plain twine and Shuset are used. On the same authority, this word Lit is known among all the Pomo tribes, even among the Tsawalu Pomo, near Guernerville. (See figs. 21 and 22.)

7. Tee (intricate) is a double structure, a Bamtush reinforced by horizontal warp across the outside of the vertical. On the inside this ware is indistinguishable from plain twined work. Its characteristics are great strength, the closest mesh, and a pattern dim and impressional. It is the most difficult and highest priced of the Tshama weaves. The openwork basket trays in Tee weave are called by Dr. Hudson psher kom, or fish plate. (See fig. 27.)

The name Shi bu, or Tschibu, applies, says Purdy, in reality to only the three-stick coiled baskets. The full name is Bam shi bu or Bamsibu—sticks three. No branch of the Pomo uses it except for three-stick baskets, and only the Calpella, Kalshe, and Ballo bai Pomo use it at all as a basket name. One-stick baskets in Calpella, Kalshe, and Ballo bai Pomo are bam cha, stick one, or tishais. The filaments of Pomo shibu coiled basketry are shaved down to uniform width and thickness with the greatest care.

Those who are studying the technic of basketry will find great possibilities in the three-strand weaving, including: (1) 3-strand twine, braid and sennit, in each of which all three strands do the same work; (2) the Thompson weave, in which one strand is wrapped about the other two twined; (3) Tee twine in which two are twined about the other one.

8. Shailo, suggested by the spiral rib of Tee, was constructed of a spiral coil of fir-root fibers bound to its adjacent coil below by a single strand of the same material catching in the lower coil fibers or the tops of its lacings. This method, the Protean Shibu, developed and considered by other California Indians, notably Yokut, as the acme of art, has long since been discarded by the Pomo as inadequate to the de-

mands of even close weaving and pattern. However, it proved the coil to be practicable, and from it evolved Tsai

9. In the Tsai (bam-cha, one rib) or single-rod coiled basketry the foundation is a single willow shoot of uniform thickness throughout, seasoned and smoothed, spiralling from base to rim, and sewed down with narrow splints of various materials Two rods are inclosed in each stitch which passes beneath the foundation of the previous turn, the stitches interlocking. This structure is quite light and elegant, permitting the most delicate treatment, both in stitch and pattern. Specimens frequently average sixty stitches to the linear inch. (See fig. 46.)

10. Baumko is the Pomo name for coiled basketry on a foundation of two stems, one above the other. It is an economical method of work, for it widens the coil and to that extent diminishes the amount of sewing. (See fig. 47 and compare Mescalero, page 467.)

11. Bamshibu or bamtsuwu (tsu-ba, three) consists of a three-rod warp or coil bound down by its lacings, catching in the lacings and one stem of the next lower coil. This is justly regarded by the Pomo as the highest type of basket art. Its materials require the most careful tests of evenness, pliability, and colour. The legitimate function of treble ribs, besides solidity, is their adaptability for retaining the bulbs of feathers, and was doubtless created by an incentive for this rich ornamentation. Comparison with other styles of work reveals the fact that by reason of fine material and pressing together of the stitches the sewing conceals the foundation, while in the varieties before mentioned the latter is visible between the stitches. (See fig. 50.)

12. Bamteck is scarcely to be looked upon as a separate style of weaving. It is simply a variety of No. 11. The manipulation of the stitches is precisely the same in both.

13. Tsawam. This is an application of the backward and forward braiding or false braiding found on the margins

of many baskets and described in the proper place in this work. The rods of the cradle are held together by a coarse cotton string obtained from the traders, and was formerly made of splint Carried across the warp rods, the weft material passes forward four, backward two, right; forward four, backward two, left—and so, alternately backward to the right or left, forms a very neat braid on one side of the basket and what looks like two rows of twined weaving on the other.

The making of a fine coiled basket requires an infinite amount of patience. The rootstocks, carefully gathered during the summer and early autumn, are split into fine strands for direct use. At Round Valley the process is as follows: The rootstocks, denuded of their outer coverings, are thoroughly soaked in warm water, and one end of a root is divided through the center, by means of the finger nails, into three parts. One of these parts is held firmly between the teeth, while by means of the fingers the whole root is carefully and very evenly split into three sections. Each of these sections is again separated into three parts in the same manner, and the same process is carried out until the strands are as fine as may be desired, the value of the basket depending in great measure upon the fineness of the strands used as well as on the general beauty of the finished fabric. These strands are used not like those from the pine root in twined work, but for thread for sewing coiled ware. In beginning the basket, three very pliant stems are so selected that when placed together their combined cross-sections will be nearly circular. The use of three "sticks" instead of one, as is sometimes the case in less costly baskets, gives much more elasticity and greater strength to the basket. The strand is wrapped tightly about one end of the compound withe, and as the wrapping progresses the wand is bent into a minute circle; the central hole is filled in by stitching over and over again, and with this as a basis the little plaque is gradually built up by coiling. The general shape and plan of the basket must necessarily be carried in

mind, for there is no skeleton to serve as a guide. Infinite care must therefore be exercised, not only in preserving the symmetry of shape, but also of the designs which are worked in with the black and white strands. It requires many months, sometimes years, of leisure work to complete a first-class bas-

FIG. 165.
TINY COILED BASKET.
Pomo Indians.
Collected by C. P. Wilcomb.

ket. Some of the very best are more or less individual in their shape and pattern. (Chesnut.)

Fig. 165 is a coiled basket of the Pomo Indians (Kulanapan family) in a style of sewing called Bamshibu. The foundation consists of three stems or rods. The stitches pass over the foundation and interlock with those underneath, giving

FIG. 166.
TINY COILED BASKET.
Pomo Indians.
Collected by C. P. Wilcomb.

a ribbed appearance to the fabric. This tiny object is a little over one-half an inch in diameter, and passes easily through a lady's finger ring. In the foundation, the uniform width of the coil and of the stitches, and the neatness of the sewing, it would be difficult to find a more charming piece of Indian handiwork.

Fig. 166 is a coiled basket of the Pomo Indians in a style of weaving called Tsai, in which a single rod is used for the

foundation, the stitches passing both over the rod of the course in progress and under the rod of the foundation of the course beneath. These small pieces represent fairly the best Pomo workmanship.

These two baskets are in the collection of C. P. Wilcomb, curator of the Golden Gate Park Museum, San Francisco, California, and were made under his supervision.

Fig. 167 is a coiled basket of the Hoochnom Indians, Yukian family. It is made in a style of coiled weaving called

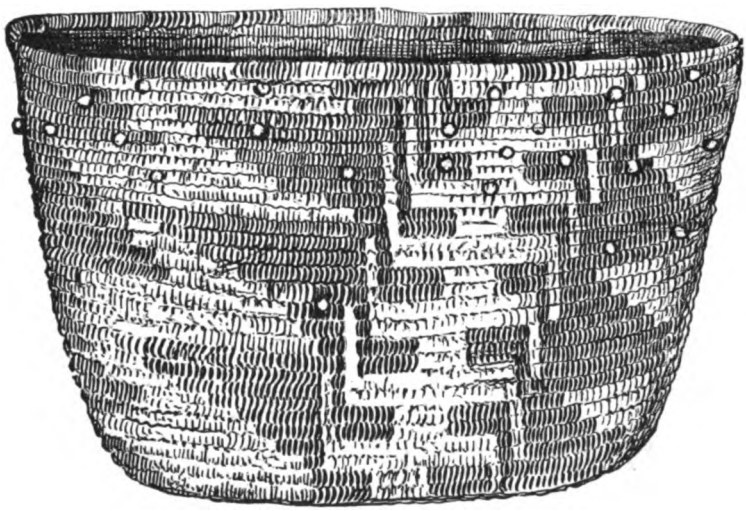


FIG. 167.
COILED BASKET.
Hoochnom Indians, California.
Cat. No. 21,371 U.S.N.M Collected by Stephen Powers.

rod and welt. In this method one or two small rods or stems of uniform thickness constitute the body or foundation of the coil. Over this is laid a thin filament or strip of material, and the stitches of each coil pass over the foundation, under the splint, and interlock. The work of the Hoochnom Indians is of excellent character, the coils being of about the same width, and the number of stitches to the inch uniform. In the example here shown, the coils are one-eighth of an inch in diameter, and there are twenty stitches to the inch. The

ornamentation appears to be the usual California combination of mountain and coil plume. The use of light and dark filaments and the alternation of triangles and rectangles on the two sides of the open space form a very attractive ornament. The use of shell disks improves the appearance of the object. Feathers are also employed on some specimens from this locality.

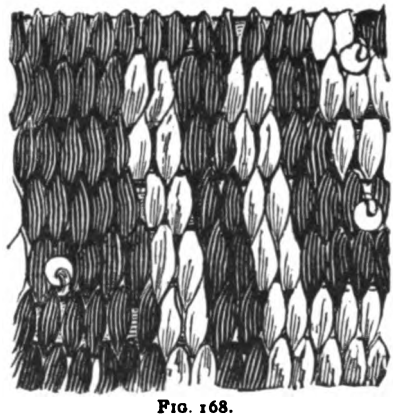


FIG. 168.
DETAIL OF FIG. 167.

A square inch shown in fig. 168 illustrates more definitely the description here given.

This specimen, Catalogue No. 21,371 in the United States National Museum, was procured in Eel River, California, by Stephen Powers.

Leaving the West Coast peoples, the next group of basketmakers will be found in the Oregon tribes belonging to the Lutuamian family, namely, the Klamath and Modocs, and the Shastas, also various bands of Wintun belonging to the Copehan family. The basketwork of this middle region is largely twined work with overlaying. The designs have been studied by Roland B. Dixon, and will be found illustrated in Plates 18 to 24 in his paper on the basket designs of northern California.* In the work here mentioned it is interesting to find that the movement has been eastward, for quite a number of these specimens figured as Maidu are very surely made under the influence of tribes here mentioned.

The Klamath Indians have their home upon the Little and Upper Klamath Lake, Klamath Marsh, and Sprague River, Oregon. Their name in their own language is E-ukskik-

* Bulletin of the American Museum of Natural History, XVII, pp. 1–32.

ni (Klamath Lake people). The Modoc are termed by the Klamath, Modokni (southern people).*

Fig. 169 is a twined flexible basket of the Klamath Indians. The body is in plain twined weaving; the three elevated bands on the outside are in three-ply twined weaving, the effect being that of hoops placed on wooden vessels for the purpose

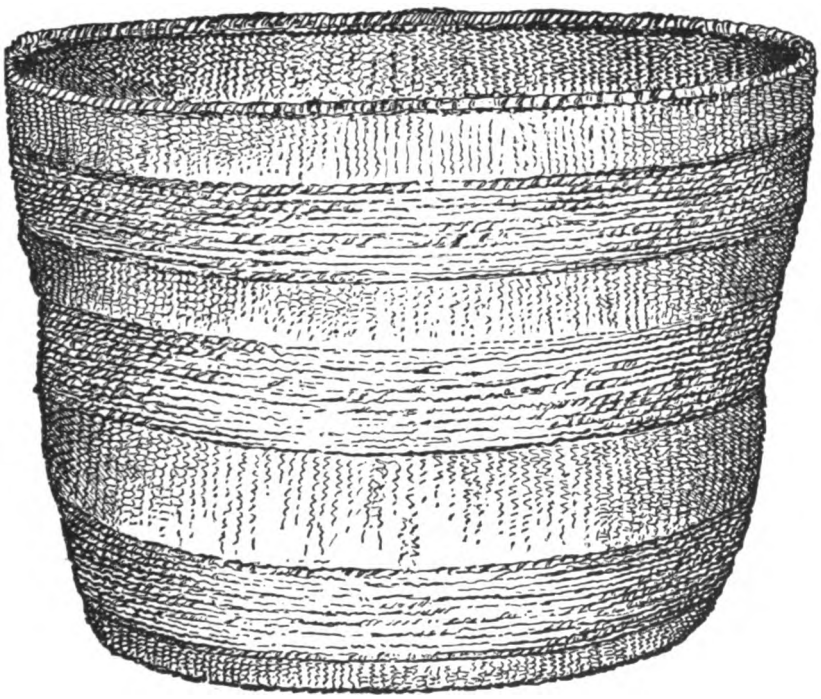


FIG. 169.
TWINED BASKET BOWL.
Klamath Indians, Oregon.
Cat. No. 24,124, U.S.N.M. Collected by L. S. Dyar.

of strengthening them, and is very pleasing. By choosing straws or stems of different plants for these three-ply bands the artistic impression is heightened. By twining dark and light coloured straws in the texture, and by varying the number of monochrome or dichrome twines, charming effects in endless variety may be produced.

* J. W. Powell, Indian Linguistic Families, Seventh Annual Report of the Bureau of Ethnology, Washington, 1891, pp. 1–142.

A square inch shown in fig. 170 makes clear the manner in which the plain twined and three ply twine may be combined, and also that of using different coloured materials. The rows in both cases, however, are monochrome. If the alternate meshes were dark and light, the beauty would be enhanced. The using of dichrome twine is rather limited to this particular area—northern California and southern Oregon.

This specimen, Catalogue No. 24,124 in the United States National Museum, was procured in Oregon by L. S. Dyar.

The following names for baskets were collected from the Hot Spring Valley Indians, Modoc County, California.

INDIAN NAME	BASKETWORK
Doch jăm′ ă.....	.Papoose basket.
Po lu′ lu.....	.Boat-shaped, used to hold trinkets and small articles.
Bă po′ kă.....	.Storage basket, also used for cooking; indeed, applied to any basket where the top curves in toward the center.
Shute′ pă.....	.Soft plaque used for gambling and winnowing.
Tă w y′ă.....	.Hard plaque used for gambling and winnowing.
Clowă′.....	Coarse basket with hole in bottom for grinding meal.
De le′ mă che.....	.Cone-shaped burden basket.
Shu′ wă.....	.Squaw's cap.
Da lu′ ti ă.....	.Coiled weave. A coiled weave storage basket is called dalutia bapoka and is greatly prized, also the plaques in dalutia weave.

Plate 174 represents two Klamath Indian baskets in the collection of Dr. C. Hart Merriam. The interesting feature in them is that the entire structure is in three-strand twined work. The border resembles closely one of the simplest among the Tlinkits, namely, the warp strands are turned down and held in place by a row of twined weaving. All the Indians of this area practise the three-strand work, but do not cover the whole basket with it This weave is reserved

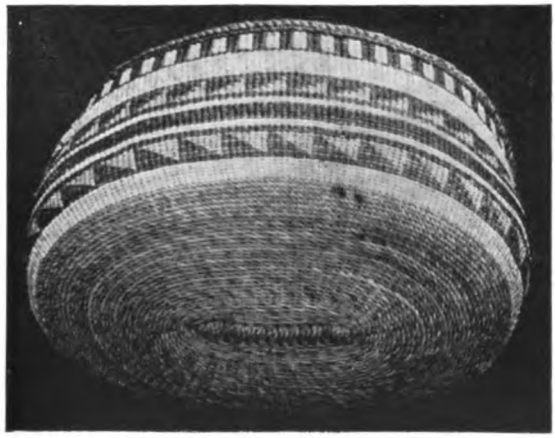


Plate 174. See page 394

THREE-STRAND TWINED BASKETS, KLAMATH INDIANS, OREGON

Collection of C. Hart Merriam

Plate 175. See page 395

PIT RIVER TWINED BASKETS

Decorations in overlaying ; shows wolf's eye, lizard's foot, and flying geese designs

Collected by L. Stone and H. F. Liston

for strengthening weak places and for ornament. It has the disadvantage of being wasteful of material.

South of the Klamath and Modoc tribes, and closely associated with them, live the Shasta Indians (Sastean family, formerly on the Klamath River from Bogus Creek to Scott River; on the Shasta River, Little Shasta and Yuka Creek; and in Scott Valley, to which has been added the Upper Salmon and a part of Rogue River in Oregon), Stephen Powers commends the strength and beauty of the Shasta women. With their basket hats fitting tight to their round heads and walking with a grenadier stride, they present quite an Amazonian appearance.* The specimens of Shasta Indian baskets in the United States National Museum are not to be distinguished fundamentally from those just described. They are in twined weaving with overlaying in straw. Their special marks are in the designs or symbols.†

FIG. 170.
DETAIL OF FIG. 169

Plate 175, top figure, represents a twined basket of the Pit River Indians. In Dixon's paper precisely the same sym-

* Powers, Contributions to North American Ethnology, III, chapter XXVI.

† Shastas, Rogue Rivers, and Calapooia tribes on Grand Ronde and Siletz Reservations. Oregon, make excellent openwork twined baskets from hazel (*Corylus californica*) sticks cut in May, peeled. Those cut in autumn are toasted, then soaked and peeled. Charming effects are produced in the seasoning of the wood. Rarely stems dyed black by soaking them in mud are used in weaving. Besides the old-time plaques, baby frames, and conical burden baskets, the latest willow ware is being freely imitated in hazel for all domestic and industrial uses.—MRS. HARRIET MCARTHUR. (See Plate 172.)

bols are seen on a basket labelled Yanan (Plate 25). The warp and weft on the bottom are of some kind of rush. The weft on the body is in stems of the squaw-grass. There are twelve twists and twenty rows of twined weaving to the inch. The colour of the body is a beautiful old gold produced by age. The ornamentation is in three sets of three rhombs, each done in black material—perhaps fern stems. Crosses and diamond patterns are employed to decorate the centers. The margin is formed by braiding down the unused warp stems. Height is 3¼ inches; diameter, 5¼ inches. Catalogue No. 19,283. Collected by Livingston Stone.

The middle figure is said to have been made by the Pit River Indians, the warp and bottom being in soft rushes. The weft of the body is in strips of rushes over which thin filaments of squaw-grass have been wound. The delicate figures are in black fern stems. Design: lizard's feet, three in number, with festoons of short lines between. The border is formed by braiding down the ends of the warp and holding them in place by a row of twined weaving. This is a very common method of treatment throughout this country. Its height is 3 inches and diameter 5½ inches. Catalogue No. 204,910, United States National Museum. Collected by Harry F. Liston.

The lower figure represents a basket from the McCloud River Indians, Copehan family. The warp is in small rods, perhaps of hazel. The weft is in twisted root of dark brown colour. The first few rows of twining, and here and there another row around the bottom, are in three-strand, the rest in double twining. The body is in the same brown material wrapped with squaw-grass, the figures showing on both sides. The ornamentation consists of four rows of double rhombs in black fern and one single row. Around the bottom is a double row in two colours. The border is finished in one row of three-strand twined weaving, the ends of the warp showing. Its height is 4½ inches and its diameter 5 inches. Catalogue

No. 19,349, United States National Museum. Collected by Livingston Stone.

Fig. 171 is a carrying basket of the McCloud River Indians, Copehan family. The tribes of this family are described by Powers under the general name of Wintun. Those living on the McCloud Fork are named Winnemen, the meaning of which term is North River. The similarity of the McCloud

FIG. 171.
CARRYING BASKET.
McCloud River Indians, California.
Cat. No. 19,290, U.S.N.M. Collected by Livingston Stone.

River basketry with that of the Pit River people will be apparent. The technic, poorly shown, is in twined weaving with a foundation of stems. The noticeable feature is the overlaying of the filaments with grass stems or fern stems to produce the ornamentation. The strength of the basket is in the weaving. The bottom is cup-shaped, and for three or four inches is in three-strand twined weaving. The rest of the workmanship is in the ordinary two-strand twine. In order to strengthen the basket, a coil of rods is sewed around

the bottom for about a foot. The border is a strong hoop attached to the warp stems by bending down the latter and sewing them in place with splints, forming a single row of coiled work. The overlaying passes to the inside, so that the figures are the same without and within the basket. On the body, the rhomboid figures forming triangular ornaments are named in Mr. Dixon's paper, "leaves strung along."

Plate 176, Catalogue Nos. 19,297 and 19,281 in the United States National Museum, are labelled McCloud River Indian baskets. They were collected by the superintendent of the United States fish-hatching establishment in northern California many years ago, and doubtless were procured from the McCloud River Indians.

The upper figure is an example of two-coloured design in plain twined weaving produced by simply hiding every alternate twist of the weft strands. The lower figure is made in the same fashion with broken bands in two colours, brown and yellow, but the border is finished off by bending down the warp stems and sewing with thread.

Plates 177–178 show the work of the Hat Creek Indians, Pakamalli, who live on Hat Creek, a branch of Pit River in northeastern California. They belong to the Palaihnihan family, which Mr. Gatschet believes to be related to the Sastean tribes. Dixon (1902) places the basketry of these tribes in his northeastern group of California tribes associated with the Klamath and Modoc (Lutuamian), Shastas (Sastean), Pit Rivers (Palaihnihan), Yana (Yanan), Wintun (Copehan), and Maidu (Pujunan). Powers* characterises the Hat Creek Indians as the most warlike in all the Pit River Basin, and the one most dreaded by the timid aborigines of the Sacramento Valley. These specimens are in the collection of H. E. Williams.

The eastern portion of northern California, as before mentioned, is largely divided between the Palaihnihan, Yanan,

* Contributions to North American Ethnology, III, 1877, p. 274.

Plate 176. See page 398

McCloud (Wintun) Twined Baskets

Showing how the patterns may be concealed or revealed at pleasure on the wrong side

Collected by Livingston Stone

Plate 177. See page 398 TWINED BASKETRY OF THE HAT CREEK INDIANS, WITH DESIGNS IN OVERLAYING. NORTHERN CALIFORNIA

Collection of H. E. Williams

Plate 178. See page 398 TWINED BASKETRY OF THE HAT CREEK INDIANS, WITH DESIGNS IN OVERLAYING. NORTHERN CALIFORNIA

Collection of H. E. Williams

and Pujunan linguistic families. It might be easily supposed by one who had no knowledge on the subject whatever that the coiled basketry of the interior basin would obtrude itself here, and either push backward the tribes making twined work, or at least the latter would be forced to a very subordinate position. Dr. Roland B. Dixon has published in the American Anthropologist, but more extensively in the Bulletin of the American Museum of Natural History,* the result of accurate studies in the basketry of the eastern tribes. The most extensive researches of Dr. Dixon are on the basketry of the Maidu Indians, described by Powers. On Powell's linguistic map these Indians are assigned to the Pujunan family. Their country lies east of the Sacramento River, and extends as far as the Nevada line, stretching north and south from the southern line of Lassen and Tehama counties to the Consumne River. A number of examples of Maidu basketry have already been described, and illustrated in Plates 56 and 57. The specimens are in the United States National Museum.

The body is either in splints of willow or other wood and a species of root. At the time of this writing, Mr. Coville was not quite sure as to the species employed. The designs on the body of the basket are in the splints of *Cercis occidentalis*, the bark and young shoots remaining in place. An inspection of a number of Maidu baskets together leaves the impression of distinct individuality. They belong to the three-rod variety of coiled weaving, and the sewing passes over the foundation, under one of the rods of the foundation beneath, the stitches interlocking. Frequently on the inside they split, which enables the sewer to give each stitch on the outer surface a vertical position. The material used in the sewing is hard, and is not driven home tight, each stitch being wide below and narrow above. After a study of one of these specimens, its colours and patterns, the investigator will have no trouble afterward in identifying a Maidu basket.

* Vol. XVII, pp. 1–32.

Dr. Dixon, who has given most attention to the lore in Maidu baskets, divides the symbols into three classes, namely, natural designs, plant designs, and those representing natural or artificial objects. His plates 1 to 17 are devoted exclusively to Maidu basketry. Among them will be seen a few in twined weaving, principally conical burden baskets. A comparison of these among themselves, and also those of the Pit River Indians and tribes living in the Sacramento Valley, indicate acculturation of some kind, borrowing ideas, or maybe women, ideas, and all. A number of Maidu baskets in the United States National Museum were collected by W. H. Holmes.

A suggestion might be made in this connection that the so-called feather design on the Dixon baskets* may be those on arrows, which in some California tribes are notched. This is only a suggestion. One of Dixon's most intricate feather patterns has narrow lines between, resembling the letter H, which might be either the rib of the feathers or the owner's mark on the shaftment of the arrow. The association of this notched half-feather design with the symbol for arrow points would be in harmony with this view. No other artificial object enters so profoundly into Indian art, gaming, lore, and ceremony.

On the map of California, covering a small spot at the angle of the eastern border, are the Washo Indians (Washoan family). They extend into the parts of Nevada adjoining, occupying the mountain region in the extreme western portion of the State about Washoe and Tahoe lakes and the towns of Carson and Virginia City. They formerly extended farther east and south, but were driven back by the Paiute, who conquered them and reduced them to complete subjection. Their basketry is the same general type as the Maidu, just north, but in execution it is far above. The material is willow splint, Tah-buk; the brown or reddish tint is that

* American Anthropologist, April-June, 1900, pp. 266–276.

Plate 179. See page 401

WASHOE COILED BASKET BOWLS

Remarkable for dainty ornamentation and faultless workmanship

Collected by E. Mead and J. W. Hudson

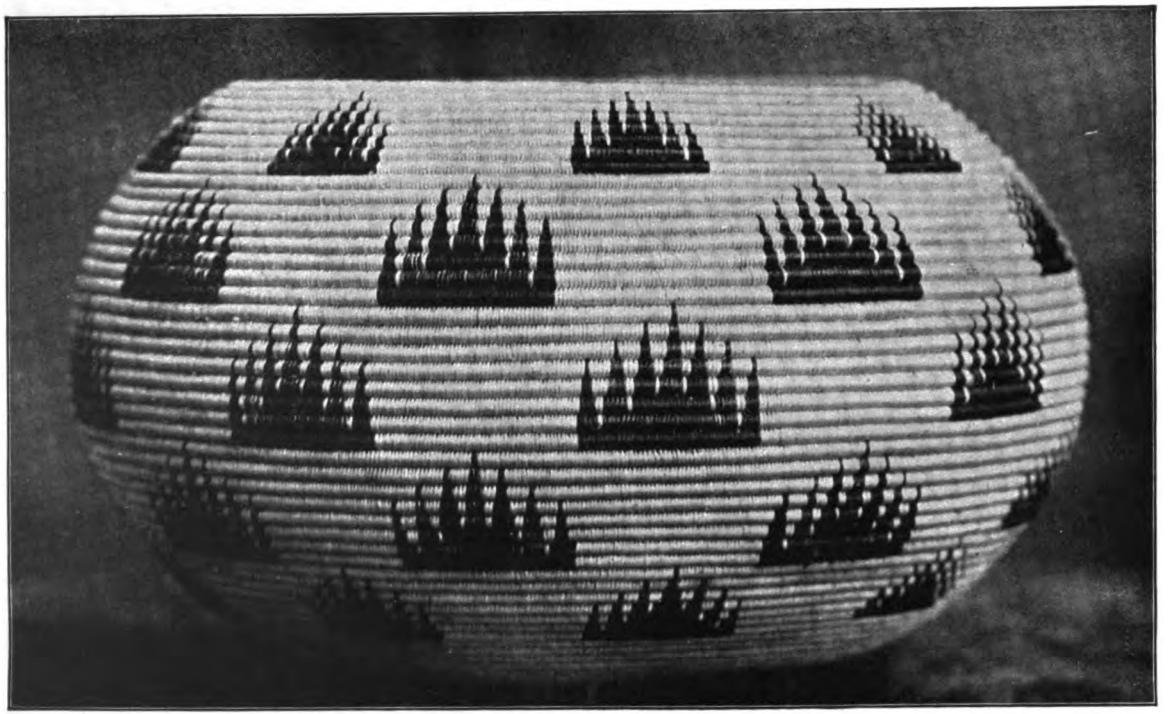


Plate 180. See page 401

FINE COILED BASKET OF THE WASHOES, NEVADA
DESIGN REPRESENTING SUNRISE

Collection of A. Cohn

of the bark of the mountain birch (*Cercis occidentalis*), Tag-goo-let, and the black is from the root of a mountain brake (*Pteridium aquilinum*), mes-sa-wag-a-see, all of lasting quality, and they acquire with age a richness that makes them incomparable. The sewing is faultless. Stitch after stitch, over and over, increases in width and length with the swelling and shrinking of the basket, like a harmony in music. The form of the specimen is charming, and the ornamentation ideal. The recognition of worth in the Washo basketmaker is encouraging, for the price of a few pieces reaches into thousands of dollars. The author heartily acknowledges the aid of Mrs. A. Cohn, of Carson City, Nevada, for information about the Washos and for photographs.

The tiny Washo offering or gift basket, when used to propitiate the harvest spirit, is filled with choicest grain or seeds or acorns from the last crop, to insure a future good harvest. One or two of the large storing or household baskets will hold the winter supply of grain or nuts. The flat cradles are for the papooses. If the child's father is a famous brave or chief, the basket is covered with buckskin and gaily decorated with beads, trinkets, tasselled fringes, or feathers. The ornamentation of the little sheltering cover for the head tells the sex of the occupant.*

Plate 179 represents three basket bowls in the United States National Museum labelled Washo. They all show the characteristics of uniformity and plain ornamentation referred to. The lowest in the series has also a margin of feather-work which allies it with the type of the tribes farther west. Catalogue Nos. 204,846, 36,244, 35,435, United States National Museum.

Plate 180 is one of the best specimens in Mrs. A. Cohn's collection. The symbol on the surface is a series of points meaning "clear skies, good weather." Mrs. Cohn finds variations in these, the number of points ranging from three to

* Clara MacNaughton, Out West, XVIII, 1903, p. 438.

seven. In some examples they are contiguous; in others, separated by narrow spaces.

Plate 181 is a picture of Datsolallee, the maker of the finest specimens of Washo basketry. She is holding in her left hand the bowed stick in the shape of a racquet, with which hot stones are stirred about in the basket of mush, while cooking. The symbols shown on the various baskets at her feet represent men, women, snakes, arrows, wind, weather symptoms, morning, and migrating.

Plate 182, upper figure, shows a basket bowl of the Washo Indians, collected by Eugene Mead. The foundation is the three-rod style in willow. The sewing is done in splints of the same material. The ornamentation on the bottom is a many-pointed star in brown cercis. On the body there are three circles made up of isosceles triangles in the same. Two of the rows on the body of the basket are so arranged as to have a narrow belt of white between them, the points of one being downward and the other upward. This form of ornamentation is suggestive of the patterns on the sewed coils of the Navaho basket bowls. The border is plain coiled sewing. Its diameter is $8\frac{3}{4}$ inches, and height $3\frac{1}{2}$ inches.

Plate 182, lower figure, is a basket bowl, Catalogue No. 204,852, United States National Museum, coiled work from Inyo County, California, tribe not positively known. There are four sets of ornamentation on the side in step pattern in threes, done in sewing splints dyed black. The most interesting feature of the basket is the border, which is in false braid, made of a single splint wrapped over the upper foundation, forward, under, and back, over again and down beneath the two foundation rows, making a figure 8.

The southern portion of the Oregon-California basket area is bounded on the west by the Pacific Ocean, and there was little encouragement to venture beyond the shore line except in San Francisco Bay and around the Santa Barbara Islands. On the north of it are the Maidu, Wintun, and the Yuki

Plate 181. See page 402

DATSOLALEE, THE WASHOE BASKET-MAKER, NEVADA

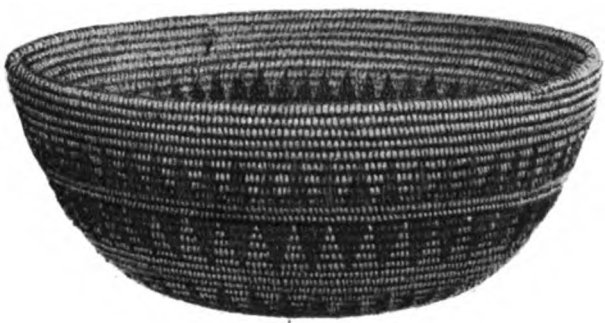
Photograph from Mrs. A. Cohn

Plate 182. See page 402

EASTERN CALIFORNIAN COILED BASKETS

Unclassed, bearing Washoe motifs

Collected by Eugene Mead



tribes. On the south, and forming a part of the subarea itself, are the Missions, some of which belong to the Yuman family, the southern boundary of the area. The great Shoshonean family has pushed across the drainage of the interior basin to the coast of Santa Barbara. This southern region is a long rectangle inclined toward the west. Its axis would be a meridian through diagonal corners. The eastern portion is Shoshonean territory. The western portion belongs to the following linguistic families: Moquelumnan, Costanoan, Mariposan, Esselenan, Salinan, and Chumashan. Along the median line of this subarea are Mono, Fresno, Inyo, Tulare, and Kern counties—another basketry Caucasus or Babel. (See fig. 163.)

Those who have made collections from this part of California will bear witness that the exchanging of baskets and of women who make baskets from tribe to tribe has rendered it almost impossible to identify forms ethnically. Here blood and speech and industry are apt to be confounded. At least, it is too early in the investigation to be positive on the subject.

Another difficulty arises in this study from the fact that language groups, tribal names, and county names are also mixed up. For instance, a basket may be called Tulare because it was purchased in that county of California, having no reference to the Indian tribe. A specimen made by the same woman will bear the name of the tribe of which she is a member. Still another one of her productions might be called from the group of languages to which her own belongs. At present, the confusion extends beyond form and design to the substances and technical processes. The author acknowledges his obligations to E. L. McLeod, of Bakersfield; C. P. Wilcomb, of San Francisco; and Dr. C. Hart Merriam, of Washington, for the information here given. Each of these has given most careful study to this cosmopolitan basket region. Dr. Merriam has

devoted special attention to the plants used and to the ethnic determination.*

Of this ware, Dr. Merriam says that most of the coiled baskets made by the Indians inhabiting the lower slopes of the Sierra from Fresno River south to the Kern are celebrated for excellence of workmanship, beauty of form, elegance of design, and richness of material, which differ in tone and texture from that used by the tribes north and south of the region indicated. When fresh, its colour is brownish buff; with age it becomes darker and richer. By careful selection a handsome dappled effect is produced. It is made from the root of a marsh plant which the Indians travel long distances to procure, identified by Miss Alice Eastwood, botanist of the California Academy of Sciences, as *Cladium mariscus*. The foundation consists of a bundle of stems of a yellow grass, *Epicampes rigens*. The black in the design is the root of the "bracken" or "brake fern," *Pteridium aquilinum*. The red is usually split branches of the redbud, *Cercis occidentalis*, with the bark on, gathered after the fall rains, when the bark is red. The tribes making the *Cladium* baskets are the Nims, Chukchansis, Cocahebas, Wuksatches, Wikchumnis, Tulares, and perhaps one or two others. Besides these, the root is sometimes used by certain squaws of the Muwa tribe living north of the Fresno and by the Pakanepull and Newooah tribes living south of the Kern; but among these its use is exceptional.

Another material which has proven a stumbling block to collectors is the red of the design in the handsome baskets made by the Kern Valley, Newooah and Panamint Shoshone Indians. This material is often called cactus root. It is the unpeeled root of the tree yucca (*Yucca arborescens*), which grows in the higher parts of the Mohave Desert, pushes over Walker Pass, and reaches down into the upper part of the valley of South Fork of the Kern. The so-called Tejon Indians

* It is too early to complete a plant synonymy for the Inyo-Kern and Tulare basketry. The list of Coville (pp. 19 to 43 of this work) and the following paragraphs from Merriam will be helpful.

obtain it in Antelope Valley, at the extreme west end of the Mohave Desert. The yucca root varies considerably in depth of colour, so that by careful selection some of the Indian women produce beautiful shaded effects and definite pattern contrasts.

Some of the Panamint Shoshones inhabiting the desolate desert region between Owens Lake and Death Valley use, either in combination with the yucca root or independently, the bright-red shafts of the wing and tail feathers of a woodpecker—the red-shafted flicker, *Colaptes cafer collaris*. These same Indians use two widely different materials for their black designs—the split seed pods of the devil's horn, *Martynia*, and the root of a marsh bulrush, *Scirpus*. The *Martynia* is a relatively coarse material, and when properly selected yields a dead black. The *Scirpus* root is a fine, delicate material, which, by burying in wet ashes, is made to assume several shades or tones, from blackish brown to purplish black, or even lustrous black.

In parts of the Colorado Desert in southeastern California the Coahuilla Indians use split strands from the leaf of the desert palm (*Neowashingtonia filamentosa*) as a surface material for their coiled baskets. The design is usually black or orange-brown, and is a rush (*Juncus*).*

The following list gives the families of the tribes in Tulare, Kern, and Inyo counties using the plants named in the first part of this description: 1. Chukchancys (Mariposan); 2. Cocahebas (Shoshonean), 3. Muwa (Moquelumnan); 4. Newooah (Shoshonean); 5. Nims (Shoshonean); 6. Pakanepull (Shoshonean); 7. Tulares (part of Olamentke div., Moquelumnan); 8. Wiktchumnes, Wikchumni (Mariposan); 9. Wuksatches, Wiksachi (Mariposan).

The elements of ornamentation are lines direct and crooked, in shapes as varied as the margins of leaves, and they might without affectation receive the same names—dentate, serrate,

* C. Hart Merriam, Science, May 23, 1903; but more especially of June 17, 1904, where this most difficult ethnic tangle is straightened out.

sinuous, etc. These simple lines are combined in parallels, herring-bone, chevrons, crenelations, and many more patterns. The triangle, the rectangle, the rhomb, and the polygon are used in great variety. Out of these elements the designs on this basketry are separate, concentric, or radial.

The separate designs are, after all, subservient to the others. Very little of this ware shows entirely free and scattered patterns. The plume or L-shape, the white and coloured rectangles associated, the groups of marks on the border, and chiefly the rectangles in two colours with hour-glass middle are most common.

Concentric designs are narrow or wide bands, whose middle portion is decorated with crooked lines and geometric figures in endless variety of combinations. Most of the bands have entire margins, but projecting margins are not unknown. The most noteworthy is Merriam's "butterfly flight design." (See Plate 194.)

The radial designs are straight or spiral. The composition of each ray is a study in itself. But a glance at a large number of baskets from this central region shows the predominance of the cuneate motive. These truncated wedges spring out of a central, circular pattern and widen toward the margin. Their surfaces and their margins are seldom entire. The spiral designs are also frequently wedge-shaped, but the manner of their composition is of the greatest interest. Lurking in them all is the stepped motive in which herring-bone or jagged lines and simple geometric figures follow one another by echelon. This on a roundish surface gives spirals of any amount of curvature. By widening and lengthening the rectangular elements the wedge-shaped interspaces are filled with the spiral pattern, and the whole surface is covered with a single design. This charming decoration is peculiar to the Santa Barbara baskets. (See Plate 49.) In outward form, the baskets of the area here considered vary from round, flat gambling mats, through trays and bowls of various depths

and hats of conical shape, to narrow-mouthed vases, or "bottle-necks," as they are called. Some of these are low and broad and closely resemble the best of ancient Arizona pottery.

The basketry of the Panamint Indians (Shoshonean) living in Death Valley, Inyo County, says Coville, is made by the squaws at the cost of a great deal of time, care, and skill. The materials are very simple. They consist of the year-old shoots of some species of tough willow, splints from *Salix lasiandra*, the year-old shoots of the aromatic sumac, *Rhus trilobata*, the long, black, slender, flexible horns on the mature pods of the unicorn plant, *Martynia louisiana*, locally known as devil horns, and the long, red roots of the tree yucca, *Yucca arborescens*. These materials give three types of colour—that of the willow and the sumac, the black of the devil horns, and the red of the yucca roots. This last material, although it has a strong fiber and a pretty red colour, is rarely used, for it is too thick to pack closely, and the resulting fabric is full of interstices.

Sumac and willow are prepared for use in the same way by the Panamint Indians. The bark is removed from the fresh shoots by biting it loose at the end and tearing it off. The woody portion is scraped to remove bud protuberances and other inequalities of the surface and is then allowed to dry. These slender stems serve as foundation. The sewing-material is prepared from the same plants. A squaw selects a fresh shoot, breaks off the too slender upper portion, and bites one end so that it starts to split into three nearly equal parts. Holding one of these in her teeth and one in either hand, she pulls them apart, guiding the splitting with her fingers so dexterously that the whole shoot is divided into three equal, even portions. Taking one of these, by a similar process she splits off the pith and the adjacent less flexible tissue from the inner face and the bark from the outer, leaving a pliant, strong, flat strip of young willow or sumac wood. Both stems and splints may be dried and kept for months, and probably even for sev-

eral years, but before being used they are always soaked in water.

The pack baskets, and some, at least, of the water baskets, are made of these splints and rods in twined work. The women begin at the bottom with two layers of rods superimposed and fastened by their middles at right angles. The free ends are bent upward, and in and out between them the strands are woven, new warp rods being inserted as the basket widens. An attempt at ornamentation is frequently made by retaining the bark on some of the strands or by staining them and by slightly varying the weave. A squaw commonly occupies an entire month constructing one such basket.

Starting from a central point to make a coiled basket, a bundle of two or three grass stems and one very slender rod is wrapped with a willow splint. At the proper point the foundation is drawn more tightly, so that the remainder of the spiral forms the sides of the basket. The wall has the thickness, therefore, of one of these bundles, and is composed of a continuous ascending spiral. The willow rod furnishes a strong hold for the stitches, and the punctures are made with an iron awl. When such an instrument can not be obtained, an admirable equivalent is substituted in the form of a stout, horny cactus spine from the devil's pincushion, *Echinocactus polycephalus*, set in a head of hard pitch. The grass stems, when the stitches are drawn tightly, make a perfect packing, and the basket when finished is water-tight.

The pack baskets of the Panamint Indians have the form of a funnel, from 1½ to 2½ feet high and not quite so broad. The loaded basket is held against the back between the shoulders, either by the hands grasping its rim, or by leather or rope thongs passed around the forehead, the body meanwhile bent forward.

The plaques are small, flat, circular pieces of closely sewed coiled work, usually 9 to 12 inches in diameter. They are flexible, and sometimes slightly saucer-shaped, and are used

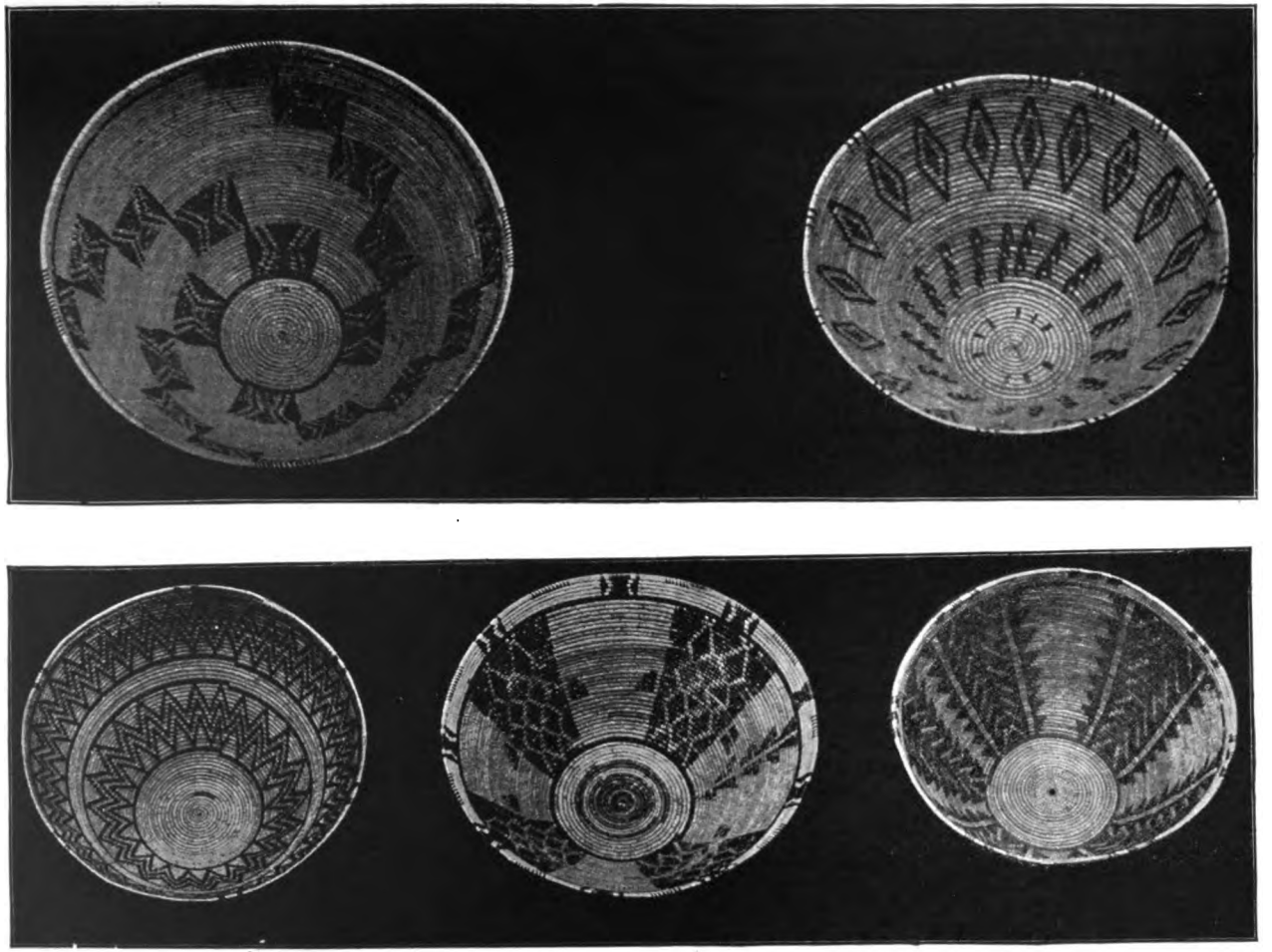


Plate 183. See page 409

COILED BOWLS OF THE PANAMINT SHOSHONEAN INDIANS, CALIFORNIA

1 2
3 4 5

Collection of C. Hart Merriam

not only as plates and pans, but also as substitutes for sieves. The material to be sifted, composed of ground seeds, is placed upon the plate and the chaff winnowed out.

The pot basket of the Panamints is in coiled work, and has the shape of a rather deep bowl with curved sides and a deep bottom, and has a capacity of about three pints. The squaw uses it as a general measure, as a bowl for dry food and for soup, and often, when in the sunshine, as a hat. Most of their starchy food is roasted dry by mixing seeds, before they are ground, with hot coals and stirring them in the basket. This process is still largely used.

The water basket has a capacity of two or three gallons. Its outline is that of an urn with a narrow neck and a rounded, conical bottom. The entire inner surface, and frequently the outside, is coated with pitch. Woven into the shoulder of the basket on one side are two loops of horsehair, or other strong material, to which is attached a thong. In carrying, this thong is passed around the forehead, while the basket is rested on the back between the shoulders.

All the Shoshonean types of weaving, all their forms of baskets, and most of the patterns on them, are ancient. The canyon walls of the upper tributaries of the Colorado are honeycombed with cliff and cave dwellings. From them came inexhaustible treasures of basketwork.*

In the collection of Dr. C. Hart Merriam in Washington City there are most excellent examples of the Panamint (Shoshonean) Indian basketwork in which the ornamentation has been a matter of especial study. Plate 183 illustrates five examples from Dr. Merriam's collection, which I am allowed here to reproduce. Before speaking of them, it will be at once noticed that these Indians, whose most numerous kindred are in the Interior Basin, have been in contact with well-known California tribes and have been subjected to their influence. (See also Plate 185.)

* See F. V. Coville's account of the Panamint Indians of Death Valley, California, American Anthropologist, V, 1892, pp. 351–361.

Fig. 1 will be recognised at once in its relationship with the Tulare tribes. The ornamentation consists of four cycloidal radii made up of rectangles in black, arranged in stepped patterns. Each one of these rectangles is ornamented with two double chevron patterns, called hour-glass designs by Dr. Dixon. In some examples the colour is mixed red and black. Collections of short and parallel lines on the border terminate the patterns.

Fig. 2, another Panamint bowl, has the center ornamented with groups of small rectangles in threes. The first band near the bottom has for decoration a design which resembles a barbed harpoon head with unilateral prongs. The principal band on the body is decorated with a series of rhombs in black, containing white and black designs within. In some of the Californian eastern tribes this design represents the eye, but until the symbol is surely known, denotive names are better. The border is decorated with groups of short marks in threes.

Fig. 3 is a bowl with plain center, excepting a short owner's mark, so-called, and on the body are two bands, each one decorated with a threefold chevroned pattern. It will be noted that the offsets in the three boundary lines of the designs are exactly in line with the finishing off at the upper border. This feature is often mentioned by basket collectors among other tribes.

Fig. 4 is another Panamint bowl, the interior decorated with plain rings in black. From the bottom project four equidistant wedge-shaped designs decorated on the surface with rhombs in white. On the border, the pattern shown in fig. 1 appears rectangular in form, with eight single chevroned designs on the surface. One of the patterns is abbreviated, and between the two wedge-shaped designs on the right side of the figure is an arrow motive which may represent arrowheads strung or the feather of the arrow notched.

Fig. 5 is another Panamint bowl, with five wedge-shaped designs on the body, proceeding from a dark ring bordering the bottom. Each design has outside edges bordered in white.

Plate 184. See page 411

TULARE AND KERN BOWLS

Showing the force of natural colours in ornamentations

Collected by J. W. Hudson and Eugene Mead

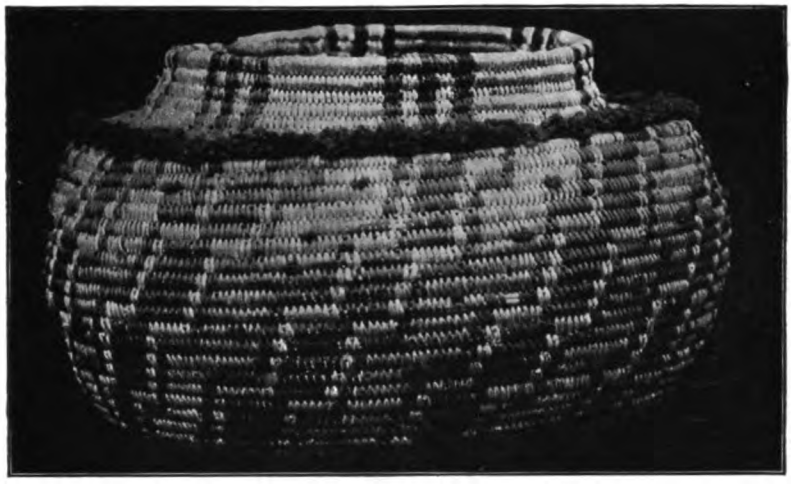


Plate 185. See page 412

TEJON BOTTLE-NECK AND YOKUT BOWL, FRESNO TYPE, CALIFORNIA

Collection of E. L. McLeod and Collection of U. S. National Museum

with serrate edges in brown and straight venations in white on the middle portion. The little groups of marks in threes on the border have nothing to do with the radiate pattern.

Plate 184 is introduced here for the purpose of showing how the colours mentioned in the foregoing pages are used in giving variety and beauty to the surface of the ware in this area. The yellow golden colour is that of the usual sewing-material. The black is produced by the use of martynia. The red is from the *Yucca arborescens*. In the ordinary photographic plate the effect of these colours is lost, but in the illustrations here given the full effect is brought out. Attention is called also in the lower figure to the union of two methods of sewing. In the figured stripe in the middle, open sewing is shown, while on the rest of the body the stitches are packed close together. It has Kern Valley or Panamint designs. On the upper bowl they are Yokut.

The following information concerning the basket tangle in this area is from Mr. C. P. Wilcomb, of the Memorial Museum, San Francisco. The Inyo and the Kern (Inyo-Kern) basketry are virtually indistinguishable; the tribes are Paiute (Shoshonean). The Tulare County basketry is that of the Yokuts, and is identical with that of the Yokuts of Fresno County and of the Monache or Monos (Shoshoneans inhabiting the headwaters of the San Joaquin and Kings rivers). The Monache and the Fresno work are somewhat coarser than that of the Tulare tribes, but in materials and shapes are identical. The Kern tribes are mostly on upper Kern River in the vicinity of Kernville.

The Tulare-Fresno foundation is made of grass stems (*Sporobolus vilfa* or *Epicampes rigens*). The Inyo-Kern foundation is of willow (*Salix lasiandra*), or sometimes of the root of sumac (*Rhus trilobata*). For the Tulare sewing, roots of slough grass (*Cyperus virens* or *Cladium mariscus*) are used, while in the Kern, willow is usually employed. For the red of their patterns the Tulare-Fresno women employ the redbud

(*Cercis occidentalis*), which is coarser than the root of the *Yucca arborescens*, used for the same purpose by the Inyo-Kern and Panamint. The Yucca root is of light yellowish-red like willow bark, but is sometimes as dark as cercis. In some of the burden baskets and winnowing trays, willow bark is used for red. The Paiutes do not use redbud. For black, the Tulare-Fresno women use the common fern root (*Pteridium aquilinum*), while in Inyo-Kern and Panamint the heart of the tule root (*Scirpus nevadensis*) and martynia are employed. In Inyo-Kern ware, quail tips and red wool are rarely used on baskets as they are on Tulare; but small private marks and symbols are wrought with split pink quills from the woodpecker known as redshafted flicker. The Tulare make many large bowl-shaped baskets. In Inyo they are small, if of this shape.

Plate 185 will emphasise the difference hinted at in the foregoing text between the coarser and finer weaving in the same area. The upper figure in the plate is a Tejon bottle-necked jar in the collection of E. L. McLeod, of Bakersfield. The ornamentation is the striped pattern well known among the different tribes in this area. The foundation is laid up rather wide for the size of the basket, and the sewing far apart, the stitches not being crowded home. Compare this with the specimen which follows:

Fig. 2, Catalogue No. 204,851, United States National Museum, is a fine coiled basket bowl collected by Eugene Mead. The foundation is of the three-stem type. The sewing is in splints of *Cladium*. The ornamentation is in the black fern root (*Pteridium aquilinum*). There are nine rows of sewing and thirteen stitches to the inch, but the most remarkable feature in this large bowl is that the three-rod foundation and the sewing together make a fabric not more than an eighth of an inch in thickness. The designs are two serrated lines in black. On either side is a combination of symbolic figures which almost resemble letters of the alphabet. There is no exact

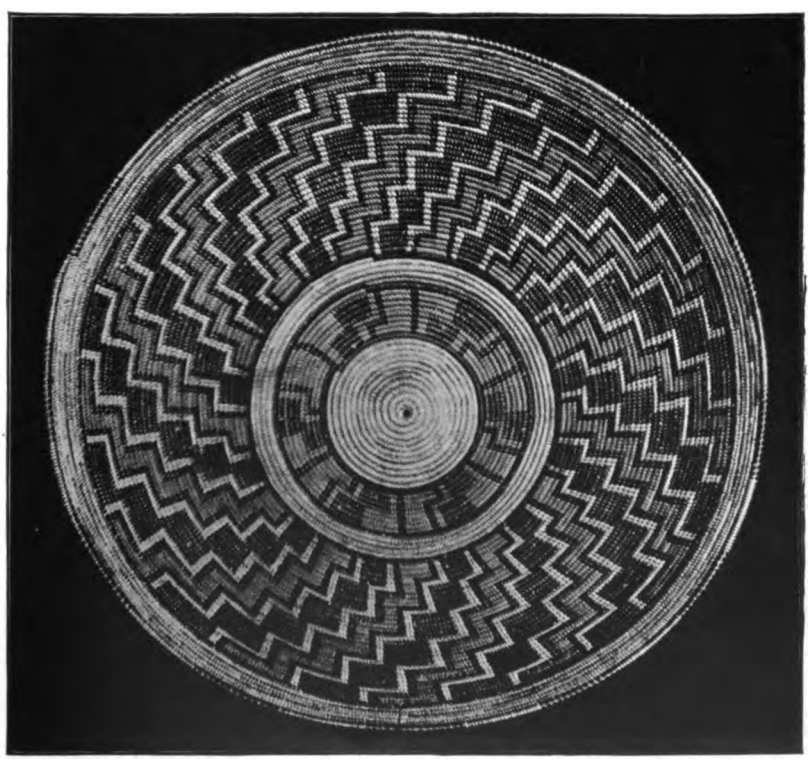


Plate 186. See page 413

YOKUT COILED BASKET BOWL, WITH STEPPED DESIGNS RADIATING, TULARE COUNTY, CAL.

Collection of C. P. Wilcomb

history of this basket. It is pronounced to be the Fresno type of Yokut basket. It is an intrusive form among the Owens Valley Paiutes, captured by them on a raid into the interior side of the Sierras a long time ago. Its height is 7¾ inches, and diameter 15 inches.

Plate 186, one of the interesting specimens in Mr. Wilcomb's collection, is an Inyo basket, made in Inyo County by a Tulare squaw. It is 13 inches in diameter. The ornamentation outside the plain centre is radial in two bands of stepped patterns, the inner band of six, the outer of thirteen. Each one of the latter having five parallel elements, there are with the interspaces seventy-eight elementary stepped designs in the band. The border is the oft-recurring bunch of coloured stitches in groups.

Plate 187 represents baskets in the collections of Stephen Powers and Miss E. F. Hubby. The upper one is Tulare, and an examination shows the difference between the open and rather coarse texture of the Tulare basket and the very much more refined type of the Santa Ynez basket below. Besides the faultless sewing and the truly charming design, another characteristic worthy of observation is the use the weaver has made of small differences of shade in the splints for sewing, giving a clouded effect to the surface.

From the Tule River country, says E. L. McLeod, we have the fine flexible work, an improvement on their more northern sisters in Fresno. But the women of the Tejon and adjacent mountain tribes certainly excelled in their basketwork. Their choice ware is much more beautifully finished, their patterns much more numerous, and here is where they show the influence of both north and south in the number and diversity of their patterns; also in the trading of materials. Old baskets have been taken from the caves where the bottom was Mission and the top beautiful, fine Tejon; also examples brought from caves in Santa Barbara County that were made over in the Tejon, as the stitch, texture, and all general

appearance go to show that they were carried about by the Indians with them.

An excellent example of moving about of basketmakers is given by McLeod. A woman was born at San Gabriel Mission, where she was baptised as Maria Narcissa, and is now about seventy years old. She was brought to the Tejon Canyon while a young child about nine years old, and she still remembers much of the language and customs of her native people. Her uncle Sabastian was General Fremont's guide into the San Joaquin Valley through the Tejon Pass. Maria Narcissa not only learned the language of her adopted people, but many of the dialects of the surrounding tribes. Between forty and fifty years ago she was taken as wife by a young American of English-German parentage. They were the parents of a large family of children, and gave them all as good an education as possible, especially the eldest daughter.

She was not able to give much light on the general family relation. The tribes from the north as far up as Tule River used to come down to the Tejon for some purpose, either religious or social. She tells of gaming baskets and great feasts and dances, where they used to play games of chance. But by far the longest travel was from San Fernando, San Gabriel, Ventura, Santa Barbara, and Santa Ynez. Many came thence every year to the Tejon, and unquestionable evidence in the meeting of all these streams exists in their basketwork.

In a translation from Costans (1769)* occurs this account of the Santa Barbara basketmakers:

> These are [the Indian women] who make the trays and vases of rushes, to which they give a thousand different forms and graceful patterns, according to the uses to which they are destined, whether it be for eating, drinking, guarding their seeds, or other ends, for these people do not know the use of earthenware as those of San Diego use it. . . .
>
> The large vessels, which hold water, are of a very strong weave

* Land of Sunshine, XV, 1901, p. 39.

Plate 187. See page 413

TULARE COILED JAR

Compared with an old and precious mission basket with key-pattern border and stepped designs

Collected by Stephen Powers and Gavin and Leonard

Plate 188. See page 415

1 2 3
6 4 7 5 8
9 10

COILED BASKETS OF KERN AND TULARE COUNTIES, CAL., FOR STUDY IN DESIGNS

Collection of E. L. McLeod

of rushes [junco], pitched within, and they give them the same form as our tinigas [water jars].

Plates 188 to 195 are taken from baskets in the McLeod collection, and cover the subjects of form and design in the Inyo-Kern and Tulare-Fresno area. They furnish an excellent opportunity of seeing how far a few simple geometric elements combine in kaleidoscopic effects in the hands of the skilful Indian woman. Some of these specimens are of exceeding delicacy, and it is a matter of wonder how so many little stems of uniform diameter could be gathered together. Gauges are out of the question.

Plate 188, fig. 1, crenelated and chevroned designs; colour, cream, black, and red; diameter, 12 inches; depth, 9 inches.

Fig. 2 is a very different pattern, resembling a pine tree; colour, two shades of brown, black, and cream; diameter, 13 inches; depth, 10 inches.

Fig. 3, diameter, 11½ inches; depth, 8½ inches; 24 stitches to the inch; very rich shades of brown, mottled, cream, and black. Pattern very peculiar; so flexible that it has been bent together; a most beautiful specimen.

Fig. 4, diameter, 11½ inches; depth, 7½ inches; 15 stitches to the inch; body, brown; design, black and cream; very rare.

Fig. 5, diameter, 11½ inches; depth, 7 inches; 22 stitches to the inch; colour, red, black, and cream.

Fig. 6, diameter, 13½ inches; depth, 9½ inches; 24 stitches to the inch; colour, cream, and two shades of brown.

Fig. 7, diameter, 11½ inches; depth, 7½ inches; 18 stitches to the inch; colour, red, black, and cream; very old; used for cooking grubs.

Fig. 8, diameter, 10 inches; depth, 7 inches; 20 stitches to the inch; colour, black, brown, red, and cream.

Fig. 9, diameter, 21½ inches; depth, 15 inches; 12 stitches to the inch; colour, cream and brown. Very effective; splints even, well made, but not closely woven; the spirals are built up by elongating the little rectangles.

Plate 189, Tulare baskets, fig. 1, diameter, 22 inches; depth, 13 inches; 30 stitches to the inch; wood mottled, dark and light brown, and red. One of the very old style of flexible gambling baskets. It would be possible to bend it together. The variety of effects here shown by the mere use of the broken line must be noted.

Fig. 2, bottle, diameter, 8½ inches; depth, 3¾ inches; diameter of neck, 2¾ inches; 17 stitches to the inch; colour, black and red; wood dark with age.

Fig. 3, diameter, 9 inches; depth, 5½ inches; 22 stitches to the inch; colour, brown, red, and white.

Fig. 4, diameter, 8 inches; depth, 4½ inches; neck, 3¾ inches; 22 stitches to the inch; colour, cream, red, and brown. Red wool and quail plumes.

Fig. 5, diameter, 9 inches; depth, 6 inches; 14 stitches to the inch; colour, black and natural wood; very old. The white woman from whom Mr. McLeod purchased this basket had owned it for fifty years.

Fig. 6, diameter, 15 inches; depth, 9 inches; 14 stitches to the inch; colour, brown, red, and mottled wood.

Fig. 7, diameter, 8 inches; depth, 8 inches; 22 stitches to the inch.

Plate 190, group of baskets from Tejon, Kern County. Fig. 1, diameter, 13 inches; depth, 7½ inches; 18 stitches to the inch; colour, cream, black, red, and brown.

Fig. 2, mortar basket; diameter, 17 inches; depth, 8 inches; colour, cream.

Fig. 3, diameter, 12½ inches; depth, 7 inches; 24 stitches to the inch; colour, black, brown, red, and cream; very old and fine specimen.

Fig. 4, diameter, 7 inches; depth, 3¾ inches; 20 stitches to the inch; colour, black, brown, cream, and with spots of yellowhammer quill.

Fig. 5, diameter, 4½ inches; depth, 3½ inches; 30 stitches

Plate 189. See page 416 COILED BASKETS FROM TULARE CO., CAL., SHOWING CHARACTERISTIC PATTERNS

Collection of E. L. McLeod

1
2 3 4
5 6 7

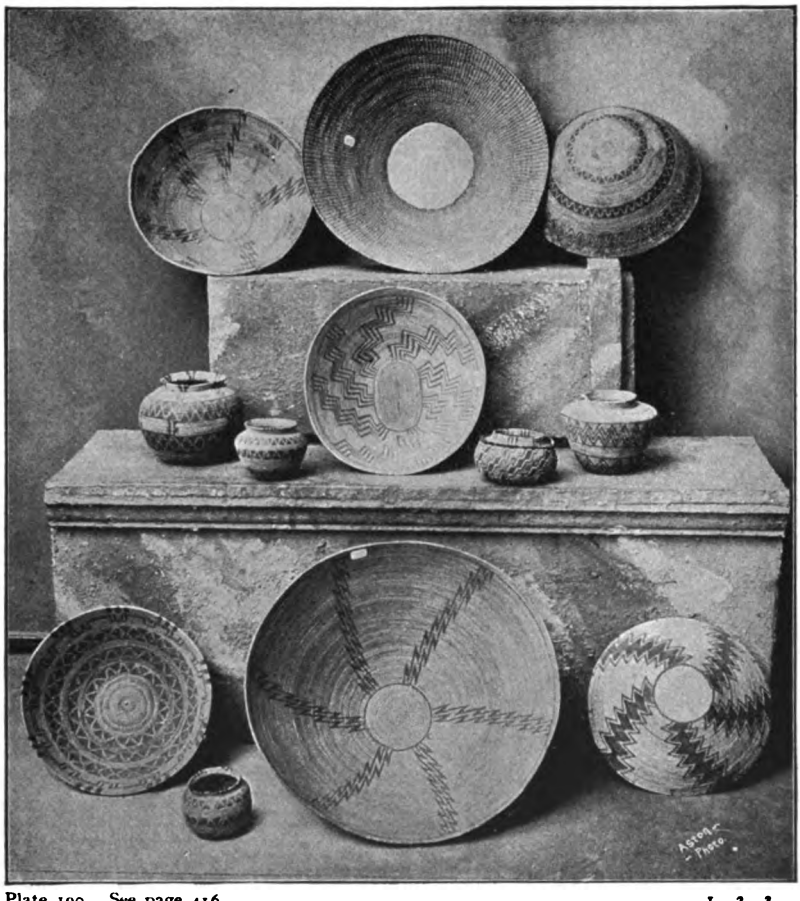


Plate 190. See page 416

1 2 3
4 5 6 7 8
9 10 11 12

GROUP OF COILED BASKETS, CHIEFLY TEJON, KERN COUNTY, CAL.

Collection of E L. McLeod

Plate 191. See page 417

1 2 3
4 5 6
7 8 9

COILED BASKETS, KERN AND TULARE TYPES, CALIFORNIA

Collection of E. L. McLeod

to the inch; colour, cream and brown; very old and most beautifully made.

Fig. 6, oblong; length, 13 inches; width, 12 inches; depth, 6 inches; 18 stitches to the inch; colour, brown and cream. A very peculiar basket, as the pattern is so allied to those of Arizona and New Mexico.

Fig. 7, diameter, 5 inches; height, 3 inches; 24 stitches to the inch; colour, dark wood, cream, brown, and white, with dots and rim of red wool. This was a birth-gift basket, being presented filled with silver coins to an Indian woman, from whom it was purchased at the birth of one of her daughters, who is now forty years old. The giver was Sabastian, General Fremont's guide.

Fig. 8, diameter, 6½ inches; height, 5¼ inches; 21 stitches to the inch; colour, black and cream; very old.

Fig. 9, diameter, 12 inches; circumference, 38 inches; depth, 7½ inches; 15 stitches to the inch; colour, black, brown, cream, and mottled wood.

Fig. 10, oblong; length, 4 inches; width, 3 inches; height, 3 inches; 22 stitches to the inch; colour, cream and brown.

Fig. 11, diameter, 20 inches; depth, 12 inches; 24 stitches to the inch; colour, cream; pattern, black.

Plate 191, baskets from Kern and Tulare counties. Fig. 1, Kern County; diameter, 18 inches; depth, 12 inches; 17 stitches to the inch; colour, cream, brown, and red. A very dark basket. The vertical row of triangles and the human figures must be observed.

Fig. 2, diameter, 8½ inches; depth, 6 inches; diameter of neck, 3¾ inches; 22 stitches to the inch; very fine in weave, shape, and finish; colour, rich cream, black, and red; very old; made at Tejon.

Fig. 3, diameter, 6 inches; depth, 4½ inches; neck diameter, 2¼ inches; 17 stitches to the inch; made at Tejon. Top is brown; bottom and patterns are white with black markings. This design is the "Sachem dancing about the funeral

baskets." Such examples are strung on poles erected at their burial places.

Fig. 4, diameter, 15½ inches; depth, 9 inches; 18 stitches to the inch; colour, cream and three shades of brown.

Fig. 5, Kern County squaw cap; diameter, 8 inches; depth, 5 inches; 26 stitches to the inch; colour, cream, black, and red.

Fig. 6, Kern County basket; diameter, 20 inches; depth, 12½ inches; colour, cream, brown, red, and black.

Fig. 7, Tulare basket; diameter, 30 inches; depth, 17 inches; 14 stitches to the inch; colour, dark wood, red, and black. Braided edge; very beautifully woven and finished. The thread is regular but wide. The squaw was one year in making it.

Fig. 8, diameter, 7¾ inches; depth, 5 inches; diameter of neck, 4 inches; 20 stitches to the inch; made in Kern County; colours, body in brown; pattern, in black and white.

Fig. 9, Tulare basket; diameter, 7 inches; depth, 4 inches; 30 stitches to the inch; colour, wood, black, red, white, dark brown, and red wool; a beauty.

Plate 192, group of baskets from South Fork Caliente Creek and Paiute Mountain (McLeod's Plate 11).

Basket No. 1, diameter, 24 inches; depth, 15½ inches; stitches, 14; colours, cream, black, red, brown. The noteworthy features are the simple, undecorated crenelations. Compare fig. 9.

No. 2, diameter, 21 inches; depth, 15½ inches; stitches, 17; colour, body, mottled wood shades; pattern, cream, black, and dark red. This is a very choice specimen. The design is one that they use when they make a basket for a special friendship gift, and is highly prized. The owner was five years in getting the squaw to part with this basket.

No. 3, described on another plate.

No. 4, diameter, 18 inches; depth, 13½ inches; stitches, 17; colour, body, wood shades; pattern, cream, black, red; a very beautiful basket.

Plate 102. See page 418

1 2
3 4 5
6 7
8 9 10 11

COILED BASKETS FROM CALIENTO CREEK AND PAIUTE MOUNTAIN, CAL. BOTTOM ROW CHIEFLY PANAMINT SHOSHONEAN

Collection of E. L. McLeod

No. 5, described on another plate.

No. 6, diameter, 7½ inches; depth, 6½ inches; stitches, 19; colour, cream, red, and black; a very fine squaw cap.

No. 7, diameter, 8 inches; depth, 6 inches; stitches, 17; colour, cream, black, and brown.

No. 8, diameter, 15½ inches; depth, 11½ inches; stitches, 14; colour, cream, red, and an unusual amount of black. This design, with some, is the tail of the rattlesnake, and with others the arrowhead. The administration of radial patterns is a striking feature in this plate. The forms of the radii, but chiefly the varied markings on them, are most effective.

No. 9, described on another plate.

No. 10, diameter, 11½ inches; depth, 9 inches; stitches, 22; colour, black, brown, and cream, with yellow-hammer quills; a very odd shape and good pattern.

No. 11, diameter, 15 inches; depth, 11 inches; stitches, 15; colour, rich red, brown, black, and cream. A very striking example and unusual for so much dark colour.

Plate 193 is a fine coiled basket of the Kern County Indians, who belong to the Shoshonean family. It was made in Canebrake Canyon by the last old basketmaker of the tribe, who was swept away in a flood in August, 1901. The decorative patterns are ideal. Nine vertical stripes in black and red, with stepped borders and diamond figures on the interior, rise from the plain bottom and extend to the lower edge of the rim. The latter has its own fine-checkered, sloping designs, with no relation to the decoration on the body. Circumference, 29 inches; diameter, 9 inches; height, 5 inches; stitches to the inch, 32; colours, red, black, and cream. A design of quail plumes is shown on the border.

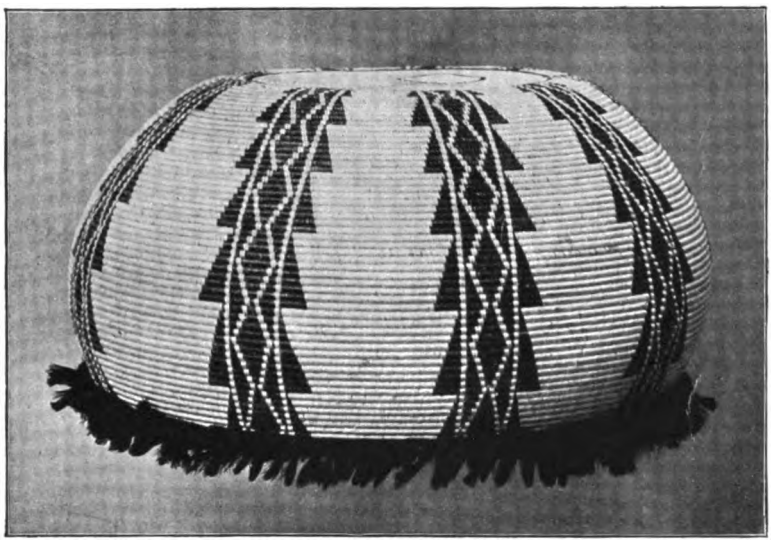
Plate 194 is a coiled bottle-neck from Canebrake Canyon, Kern River, Kern County. Diameter, 9 inches; height, 6 inches; stitches to the inch, 24; colour, cream, black, and brown. This and Plate 193 were both made by the same squaw, who was supposed to be about eighty-five years of age,

and was the last really good weaver in Kern County. The ornamentation on this basket consists in a band of dentate figures on the bottom and three bands of crenelated ornament on the body and top. The dentate figures also occur on the outer projection of the crenelles on the body. Dr. Merriam has found this pattern symbolising the spasmodic flight of a butterfly. Below the border of the lower band are rhombs in pairs, and there are five checker oblique patterns about the rim.

Plate 195, McLeod collection, is a Kern County basket from Paiute Mountain, called by him the apostolic basket, from the human figures on the top. Diameter, 15 inches; height, 12 inches; stitches to the inch, 28; colours, red, brown, black, and cream. The owner speaks of this as the most beautiful specimen in his collection. The woman was three years at work on it, and it is at least sixty years old. The ornamentation consists of discrete figures of five rectangles, thirteen men on the upper part, but chiefly of seven radial patterns ascending to the mouth. Each is made up of a continuous series of rectangular figures touching and by echelon. This pattern will be seen frequently, and the specimen may be taken as a type of that particular design.

Fig. 172 is a grasshopper basket of the Wikchumni Indians (Mariposan family), in a style of technic which may be called interrupted coiled work. The foundation is a small bundle of stems or shreds. The sewing consists in wrapping the foundation from five to ten times with the splint, and then catching this under one or two turns of the coil below in the form of stitches, the only bond which holds the fabric together being these few stitches. Another example of this sort of interrupted work in North America is shown in Plate 126, illustrating basketry from the Eskimo of Hudson Bay.

The existence of this type of basketry in a restricted area among the Mariposan family raises interesting questions about the cause of its occurrence here. The ornamentation consists



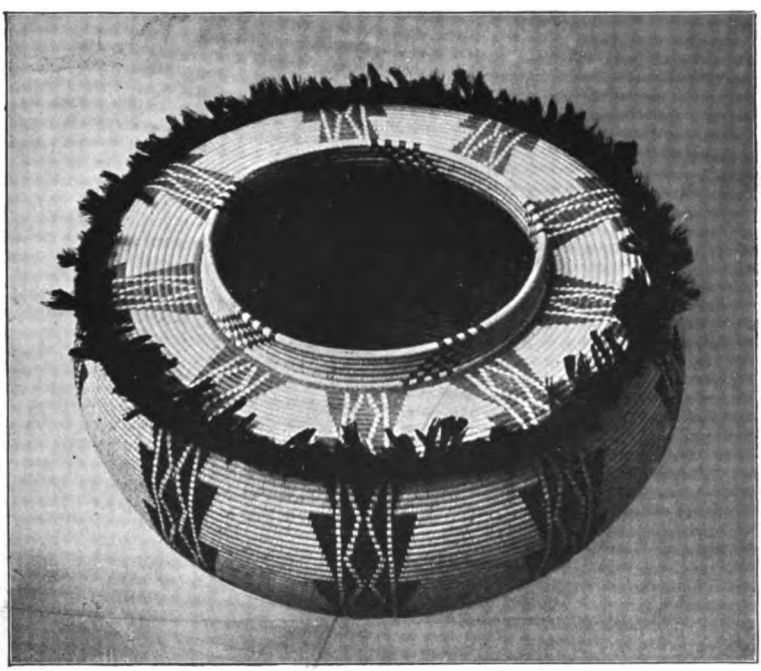


Plate 193. See page 419

BOTTLE-NECK COILED BOWL, TRIMMED WITH FEATHERS, KERN COUNTY, CAL.

Collection of E. L. McLeod

in rows, hour-glass patterns, and figures resembling the letters of the alphabet, done in brown material, like cercis or fern stems.

The detail of this interrupted work is well shown in fig. 173, where the wrapping is plainly illustrated, and also the methods of joining. By bringing the stitches one over another, geometrical patterns are produced. As the work widens, new rows are introduced, as will be seen in the principal figure.

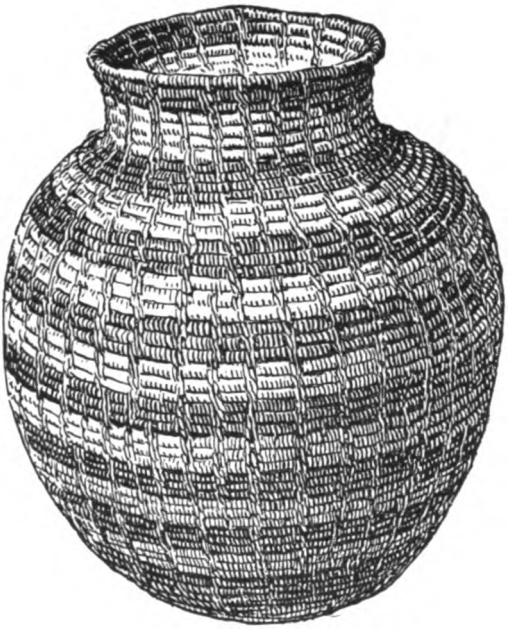


FIG. 172.
GRASSHOPPER BASKET.
Wikchumi Indians, California.
Cat. No. 215,586, U.S.N.M.

This specimen, Catalogue No. 215,586 in the United States National Museum, is a gift from C. P. Wilcomb, of California.

Mr. McLeod, who has the largest collection of the grasshopper baskets, says of them that they have no such function. They are all made by two families, the Butterbread and the Williams, living in Kelsey Canyon, Kern County, California. The sewing and wrapping are faultless. The ornamentation is chiefly in plain lines and rectangles. On one of them, fig. 10, the chevroned design is attempted with doubtful success, but figs. 2 and 3 have the stepped radial patterns well carried out, and on fig. 9 the human conventional figure is cleverly executed. (See Plate 196.)

Mission Indian basketmakers belong to the Shoshonean

and Yuman families. They receive their several names from the Franciscan missions of southern California, into which they were gathered, and where their tribal identity was lost. In the present state of knowledge it is not possible to distinguish the linguistic family of each by the shape, technic, or designs of basketry. In Powell's Indian linguistic families the Yuman tribes include the Coconino or Havasupai, Cocopas, Yuman proper, Diegueños, Maricopas, Mohave, Seri, Guaicum, and Walapai. These tribes occupied the peninsula of lower California, and are also mixed with other tribes in southern California, and across the Colorado into Mexico and southward into Mexico.

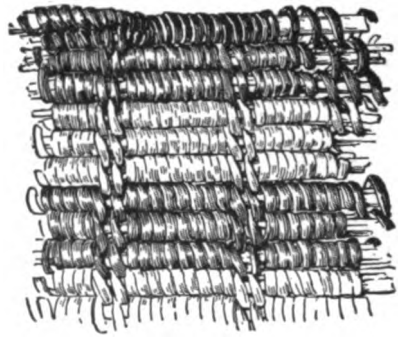


FIG. 173.
DETAIL OF FIG. 172.

The material of Mission Indian baskets differs according to locality. A rush, probably several species, is used for the sewing. The best known to Mr. Coville is *Juncus lesnerii*, the Techahet Indians using it almost exclusively. This plant is collected and dried, and what are often thought to be brushes by strangers are merely bunches of this rush prepared for the weaver's use. A tall, thin grass, *Vilfa rigens*, is used as the body of the coil, about which pieces of the *Juncus* are wound. Such of the latter as are intended for ornamentation are dyed black by steeping in water with portions of *Sueda diffusa;* and a rich yellowish brown is produced in a like manner from the plants *Dalea emoryi* and *Dalea polyadenia*. The bottoms of large baskets are often strengthened by the introduction of twigs of *Rhus aromatica* or three-leaf sumac. Dr. Merriam finds that latterly the leaf of a palm (*Neowashingtonia filamentosa*) is used for sewing. The work resembles that done in raffia.

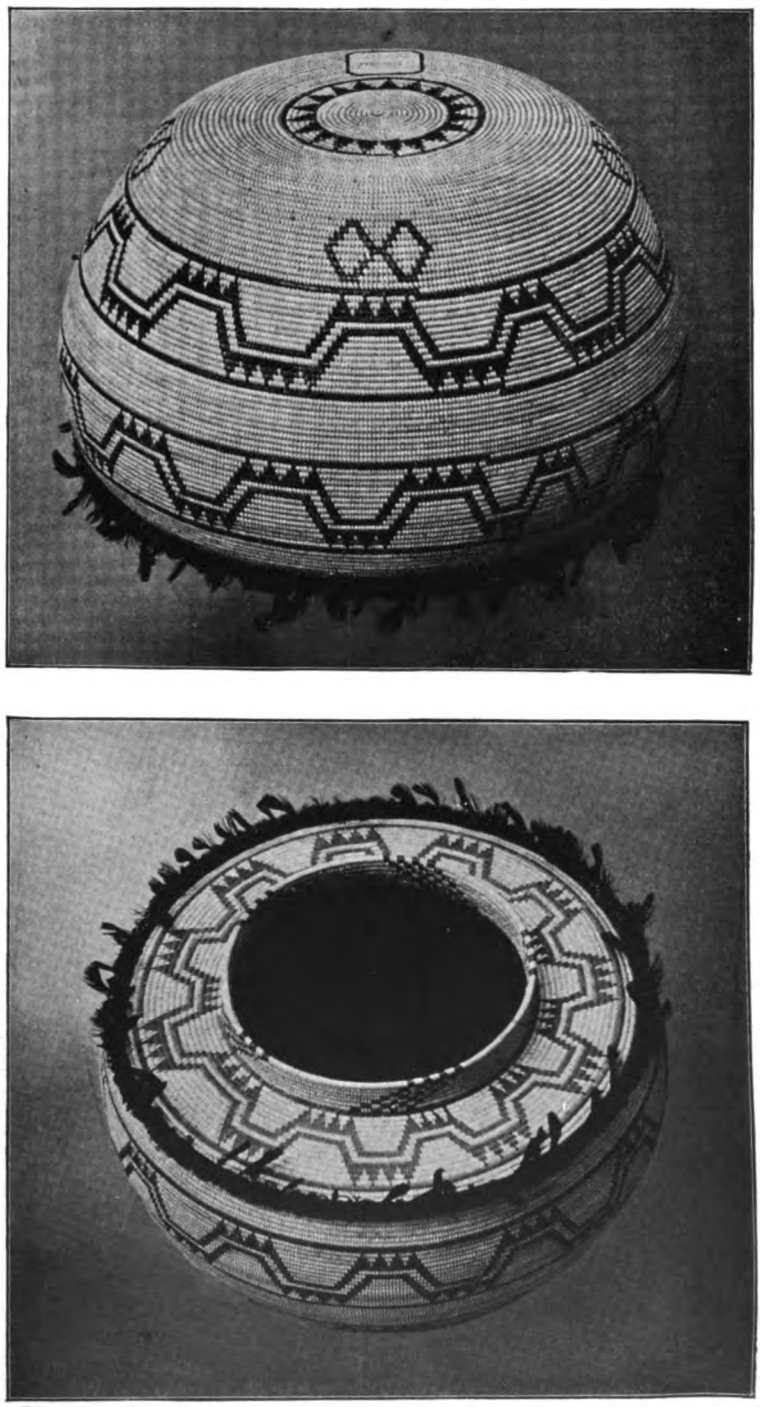
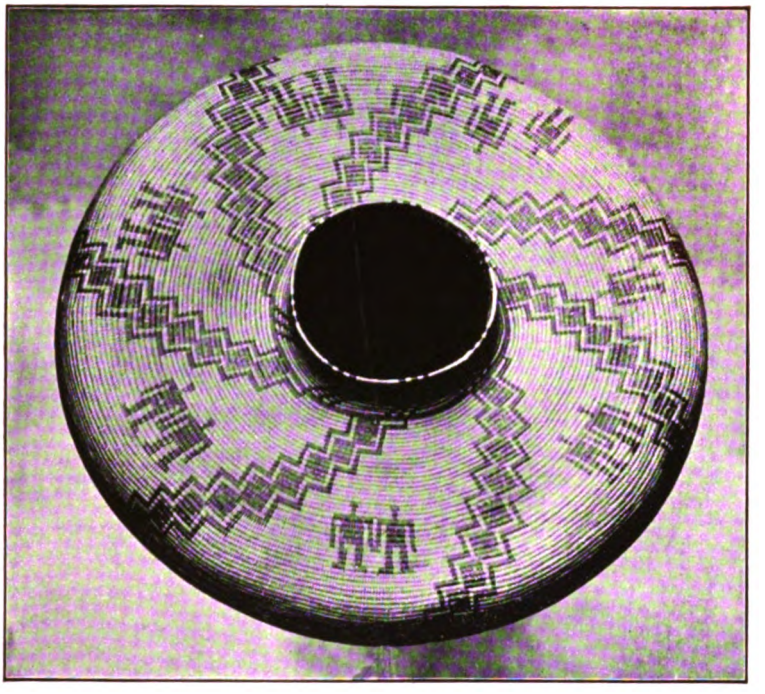


Plate 194. See page 419

BOTTLE-NECK COILED BOWL, WITH BUTTERFLY FLIGHT DESIGN, KERN COUNTY, CAL.



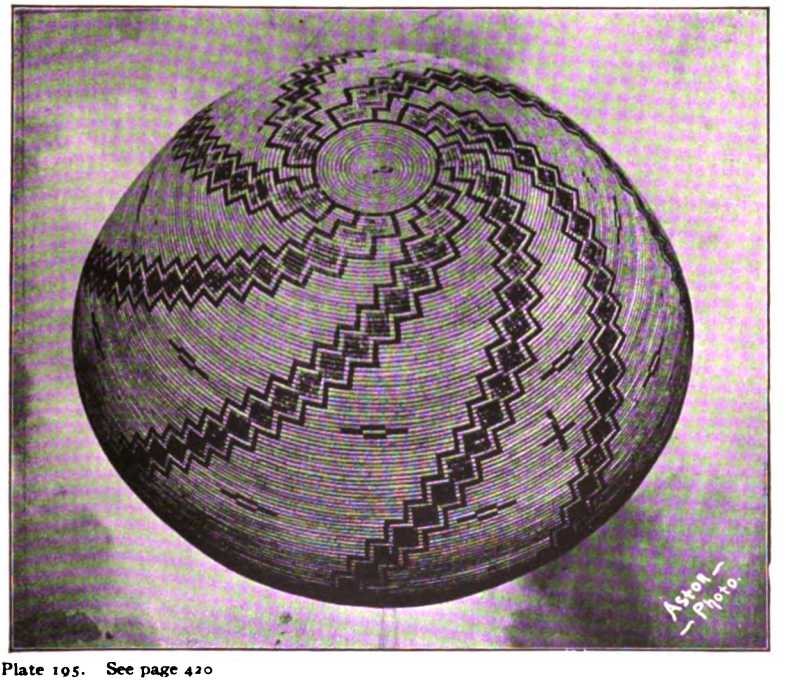


Plate 195. See page 420

APOSTLE BASKET. FLAT TOP BOTTLE-NECK, KERN COUNTY, CAL.

Collection of E. L. McLeod

In beginning a basket, a central foundation is made and the rush wound about it and coiled, fastened by fibers passing through holes made for the purpose with a pointed bone or metal awl. This is the commonest method employed.

To assist the student in understanding the relationship of arts in southern California, the following account of tribes from Dr. Barrows will be helpful. The Indian tribes south of Santa Inez Mountains on the coast and San Joaquin Valley in the interior fall into three divisions: (1) Tribes of Santa Barbara channels and islands covering the coast of Ventura County; (2) Serraños; (3) Coahuillas.

The Serraños live on a small reservation at San Bernardino and on the Morongo Reservation in the San Gorgonio pass in southern California. They are called Takhtam by Loew.

The Coahuillas live in the Colorado Desert and the San Jacinto Mountains. The word is also spelled Kauvuyah by Gatschet after Loew. Dr. Barrows thinks this to be only the German spelling for Coahuilla (pronounced Kau-vū-yah).

With them he joins by speech the Indians of the missions northward, making a Coahuillian linguistic family; perhaps it were better a subfamily.

Coahuillian subfamily

1. Coahuillas. Colorado Desert and San Jacinto Mountains.
2. Gaitchim. Oscar Loew's name for Netela.
3. Kechi. Missions of San Luis Rey.
4. Kizh. San Gabriel Mission.
5. Luiseños. (*See* Kechi.)
6. San Fernando Mission.
7. Serraños.
8. Takhtam or Takhtem, Loew's name for Serraños.
9. Temeculas. At Pechanga, eight miles north from Luiseños.
10. Tobikhar. Loew's name for Kizh.

Barrows narrates that the Coahuilla basketry and that of the Diegueños as well as Luiseños is of the one California type, namely, coiled ware, and fragments of similar technic have

been found by Schumacher in the graves of the Santa Barbara channel. He quotes Humboldt to the effect that the Indians presented the Spaniards "with vases curiously wrought of stalks of rushes and covered with a very thin layer of asphaltum that renders them impenetrable to water." Lumps of the material are said to have been put into the basket with hot stones and shaken with a rotary motion to distribute it. The foundation of the coil is a bunch of grass, su-ul (*Vilfa rigens*); the sewing-material varies according to the colour desired. The three-leaf sumac (*Rhus trilobata*) gives a light straw colour; these are dyed black in a wash made from the berry stain of the elder, hun kwat (*Sambucus*). The other sewing-material is a bulrush or reed grass (*Juncus lesnerii*, or *Juncus robustus*). The scape and leaves are 2 to 4 feet high or more, stout, and pungent. A supply of these is gathered by the basketmaker and cut into suitable lengths. The woman then with her hands and teeth splits the scape carefully into three equal portions. Near its base the rush is of a deep red, lightening in colour upward, passing through several shades of light brown, and ending at the top in a brownish yellow. For dyeing black, ngaial (*Sueda diffusa*) is also employed, and Dr. Palmer also mentions a dahlia (D. *polyadenia*) as furnishing a yellowish-brown dye.

The Techahet use the reed grass (*Juncus robustus*) or the *Rhus trilobata*, and the tall, thin grass (*Vilfa rigens*) in a dried state for making basketry, the first two for binding material, the latter for the body. The reed grass is split and some of it dyed, usually brown. The basket is begun at the center of the bottom, the thickness of the coil of grass depending upon the size of the basket to be made. A bone pricker is used. The coil is begun by laying one end of the filament upon the bunch of grass and taking a few wraps about it to hold it down. This is bent double, and the sewing progresses by catching the filament over the bunch of grass through the coil of the sewing filament made at the last turn.

Plate 196. See page 421 OPENWORK COILED, "GRASSHOPPER," BASKETS, KERN COUNTY, CAL.

Collection of E. L. McLeod

1 2 3
4 5 6 7
8 9 10 11 12

Basket-making among the Coahuillas belongs to the old women. They sit flat on the ground, with the feet thrust out in front. The deft artist holds her work in her lap; at her right lies the grass for the foundation; on her left, soaking in a pot of water, her variously coloured splints. Her only tool is her awl, "wish," anciently of bone; or a cactus spine set in a piece of asphaltum; but now a nail serves the purpose, one end pointed, the other in a handle of manzanita wood. The sewing-materials are named according to colours —the scapes of *juncas* se il; the red portion, i i ul; dyed black they are se-il-tu-iksh. Splints from sumac are se-lit, and the grass of the foundation su-ul. No model or pattern is ever used. The border is finished by simply cutting the sewing-material close on the inner side. The most common form, se-whal-lal, of the Coahuilla basket has a flat bottom and gently flaring sides, a depth of from 4 to 7 inches, and a width of from 13 to 20 inches. These are for holding foods, including seeds, grains, and fruits, household utensils, and basket materials. Small, globular baskets, with bulging sides and rather wide mouths, 5 to 10 inches in diameter, are called te-vin-ze-mal. They are the prettiest and the most carefully ornamented, and are used to hold trinkets and sewing-materials. The deep packing baskets, se-kwa-vel-em, are about eighteen inches deep and are used for carrying loads. Rawhide strings, ka wi ve, are tied to the opposite edges to pass around the forehead, but usually the basket is sustained in a net. They are used not only for food gathering, but on the threshing floor for storing foods. The chi-pat-mal is a round, almost flat basket, 16 to 18 inches in diameter and one or more inches deep, used for harvesting. The woman beats it full of grass seeds or fills it with elder berries or cactus fruit, and transfers the contents to the packing basket on her back. It makes a good tray, platter, fruit dish, or receptacle for meal, and is exclusively the winnower.

The basket hat, yu-ma-wal, shaped like a truncated cone,

is worn by women especially to protect the head from the carrying band. It serves also for a water dipper or mixing pan. The chi-pa-cha-kish, holding about two quarts, is an openwork basket of network, made from the unsplit, flattened scapes of the se-il, or Juncus. They are often provided with a bail, and hung up in the house or ramada to hold fruit or vegetables.*

Fig. 174 is a coiled basket of the Coahuilla (Shoshonean family). The foundation coil is of stems of grass; the sewing is in

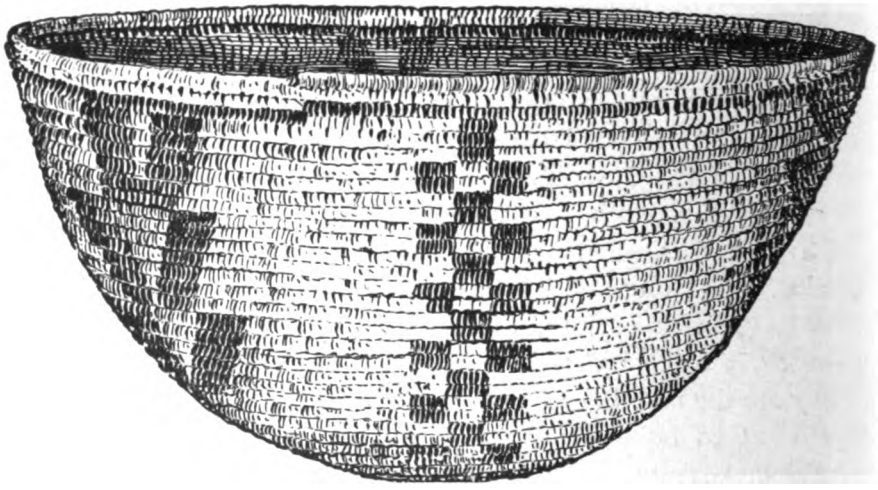


FIG. 174.
COILED BOWL.
Coahuilla Indians, California.
Cat. No. 21,787, U.S.N.M. Collected by Edward Palmer.

splints of sumac (*Rhus trilobata*). The ornamentation is in stems of rush dyed black with sea-blite (*Dondia suffrutescens*).

No special study has been made of the meaning in the designs upon the Coahuilla basketry. It is impossible, therefore, to guess what the combinations of parallelograms may mean. From the point of view of elementary forms in design, it is interesting to note what diversities of effects may be pro-

* David Prescott Barrows, The Ethno-Botany of the Coahuilla Indians of Southern California, Chicago, 1900. Chapter IV (quoting Paul Schumacher, Humboldt, Hugo Reid, and Edward Palmer).

Plate 197. See page 428

MISSION INDIAN COILED BOWL, SHOWING CHARMING SHADES OF THE MATERIAL

Collected by Horatio N. Rust

duced by variations in the form and composition of simple geometric patterns. Five of the figures on the example here shown are built up of rhomboidal elements, and a single one is the composition of rectangles in quincunxes.

Fig. 175 is a view of the inside of the bowl, showing the ornamentation. A square inch of coil foundation, made up of straws or small filaments, is shown in fig. 176. This speci-

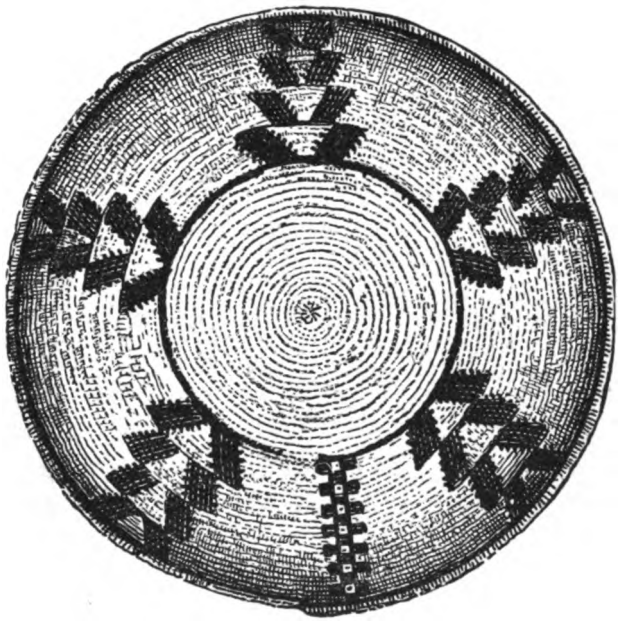


FIG. 175
INSIDE VIEW OF FIG. 174.

men, Catalogue No. 21,787 in the United States National Museum, was procured in southern California by Edward Palmer.

Fig. 177 is an inside view of another specimen from the Coahuilla, made of the same material. It is possible that some of the specimens from this tribe are sewed with splints of willow. It is difficult in the dried form to distinguish the two materials. The pretty, attractive design on this speci-

men is simplicity itself. Small triangles are arranged in two rows, half of them joining outward and the other half inward from the base, forming a continuous circle. One row is so suggested with reference to the other that the white space between forms a continuous chevron. It is a little difficult to say whether the whole meaning of such a result from simple processes was in the mind of the basketmaker. While not wishing to deprive her of all the credit due to her for this beautiful work, one can scarcely refrain from thinking that the total effect was not comprehended by the artist.

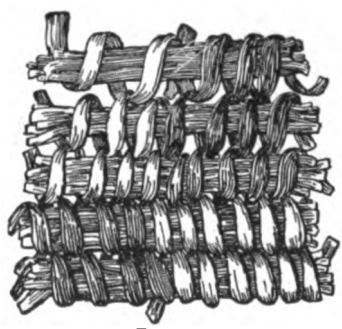


FIG. 176.
SQUARE INCH OF FIG. 174.

This specimen, Catalogue No. 21,786 in the United States National Museum, was collected in southern California by Edward Palmer.

Plate 197 is a plain Mission bowl in the Rust collection, United States National Museum. Its shape, foundation, and sewing are all typical. The general shading and the spots on the surface were achieved by using different parts of the straw.

Plate 198, of the same collection, also illustrates typical Mission ware. The designs are not exclusively of the region. In the right-hand pile several colours are introduced, and they are instructive as showing the artist's struggles to unite natural shades in the material with geometric designs in coiled textile. The top basket in this row is made of desert palm (*Neowashingtonia filamentosa*), described first by C. Hart Merriam (p. 405), and the sewing is in highly coloured materials. Palmer long ago told us that the Coahuilla Indians used sea-blite and Parosela in dyeing the rushes used in basketry. It is just possible that those who are looking for materials for basket-making may find the desert palm serviceable.

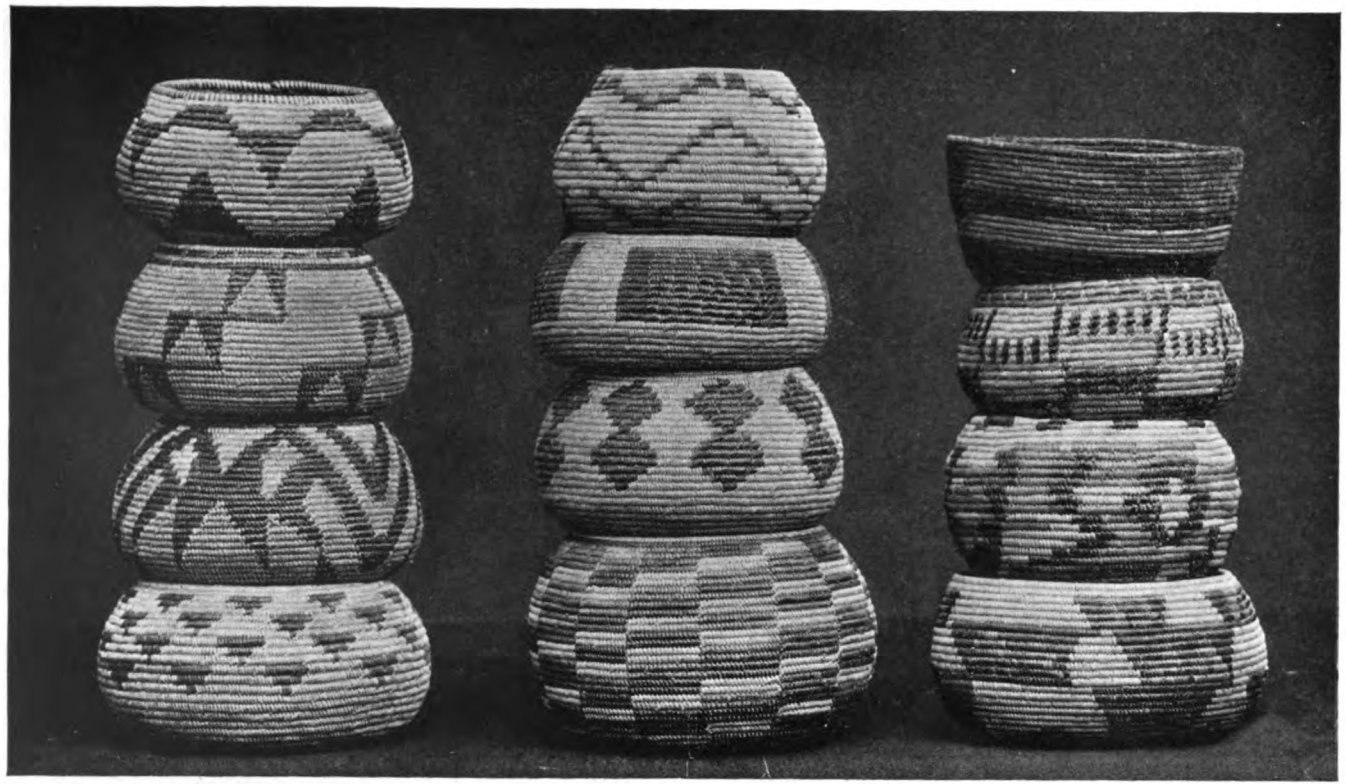


Plate 198. See page 428

MISSION INDIAN DESIGNS ON BASKETRY, ORIGINAL AND BORROWED

Collected by Horatio N. Rust

Plate 199. See page 429

Mission Indian Coiled Bowl

Designs dyed with sea-blite and in natural colours. The stripe near the middle said to be the owner's mark

Collection of George Wharton James

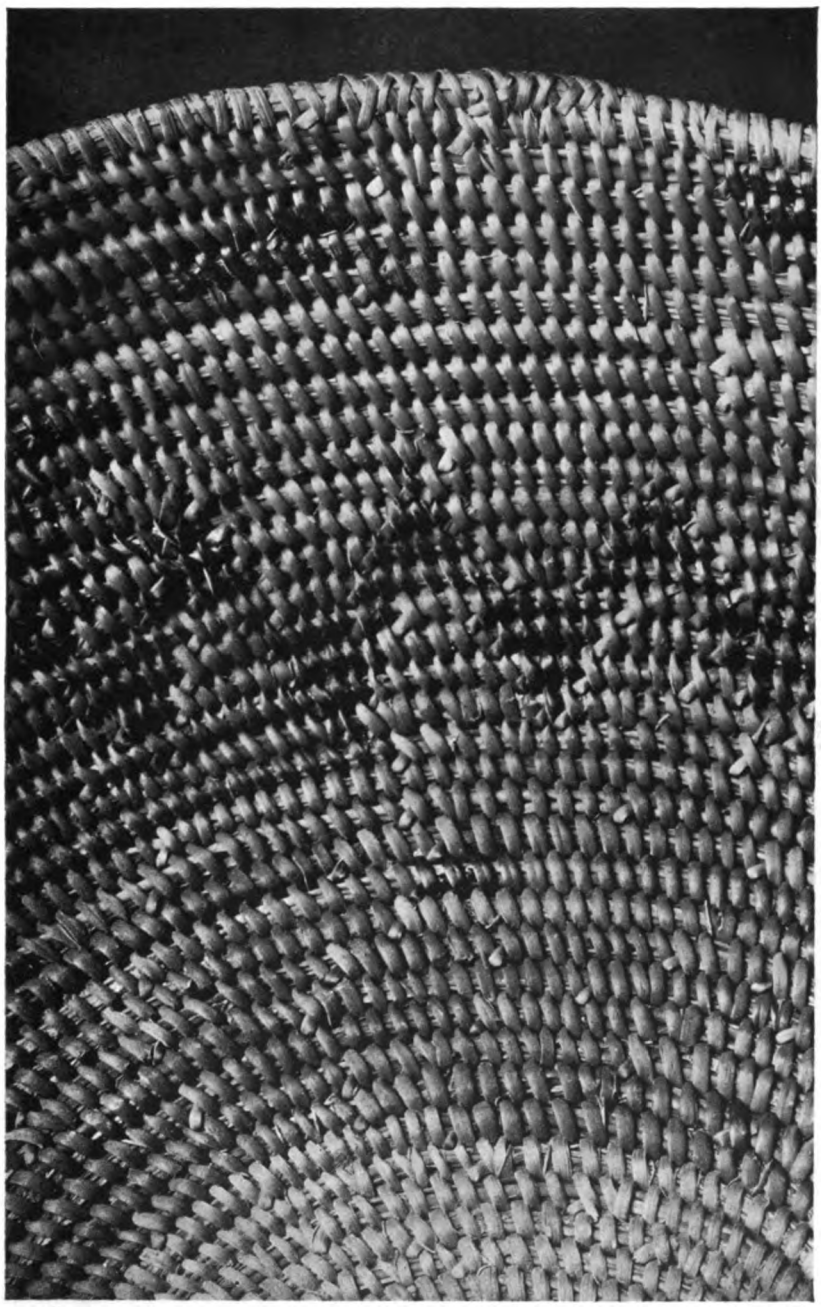


Plate 200. See page 429

DETAIL OF MISSION INDIAN COILED BOWL, COILING, DECORATING, BORDERING, AND FASTENING OFF

Detail of Plate 197

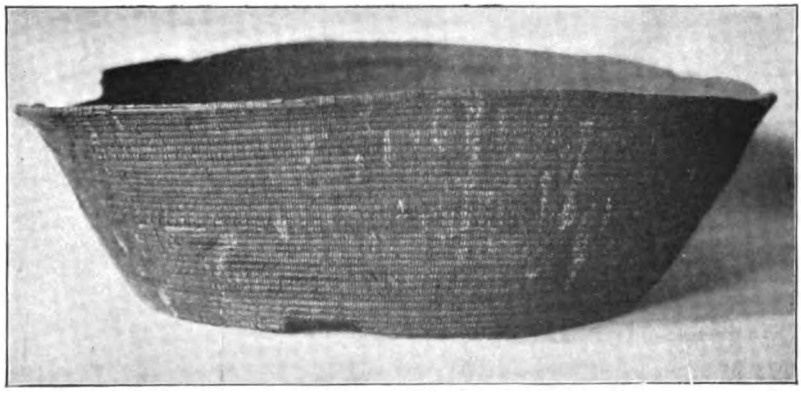


Plate 201. See page 429

ANCIENT COILED BOWLS, FROM SAN MARTIN MOUNTAIN, CAL., IN PEABODY MUSEUM

Photographed by C. C. Willoughby

Plate 199 is a coiled bowl made by the Mission Indians of California, illustrating the technic with splint foundation. The sewing of the Mission baskets is sometimes in bulrush and at others in splints. The dark mark near the center is said to be the signature of the maker. The colours in the orna-

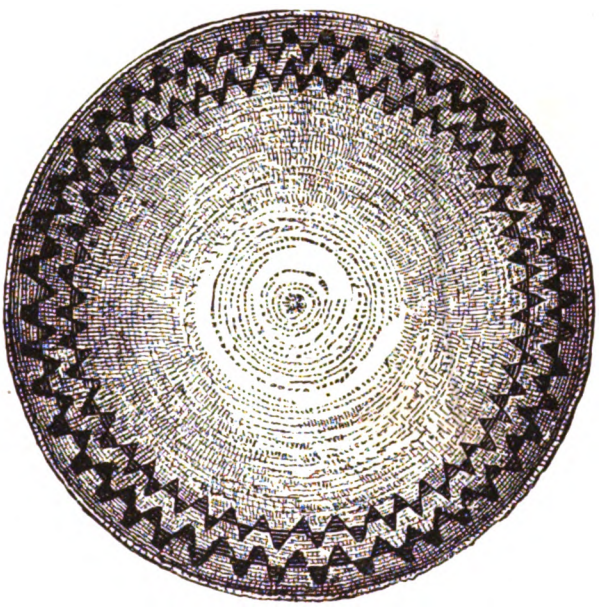


FIG. 177.
COILED BOWL.
Coahuilla Indians, California.
Cat. No. 21,786, U.S.N.M. Collected by Edward Palmer.

ment around the border are produced by sewing dyed or natural material of different shades.

Plate 200 is introduced to make plain the intimate structure of this species of coiling with short stems of soft rushes over grass foundation. The methods of inserting figures, bordering, and fastening off are evident in the illustration.

Plate 201, from photographs by C. C. Willoughby, presents two very ancient tray-shaped baskets or plaques from the cave in San Martin Mountains, Los Angeles County, California, which were collected by Stephen Bowers. The Catalogue No.

is 39,245, in the Peabody Museum, Cambridge, Massachusetts. (See also Plate 202.)

The upper figure is a fine old example of coiled weaving in the three-rod type, the stitch interlocking with the upper element.

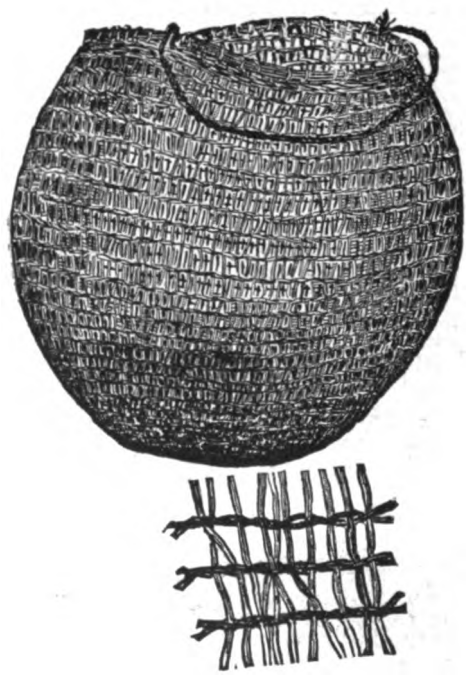


FIG. 178.
TWINED BASKET.
Diegueños Indians.
Cat. No. 19,742, U.S.N.M. Collected by Edward Palmer.

The lower figure is an example of the same kind of coiling, but the surface has been covered with asphalt, so that the texture is almost totally obliterated.

Twined weaving is not so common as coiled work in southern California. One could scarcely conceive a more primitive specimen, however, than is shown in fig. 178, from the Diegueños Indians (Yuman family) living about San Diego, California. The specimen is a basket for cactus fruit. The warp is gathered singly or in pairs in the twists of the weft. Old specimens of twined weaving from the region, on the contrary, are finely wrought.

Plate 203 represents a sack in twined weaving, collected at Mesa Grande, on the Mission Indian Reservation, in southern California, by Mrs. Watkins, the Government teacher there, and sent to the National Museum by Miss Constance Goddard DuBois. The dark threads are said by Mrs. Watkins to be made from the inner bark of *Asclepias vestita*, and the lighter threads, in which the decorative bands are worked, from

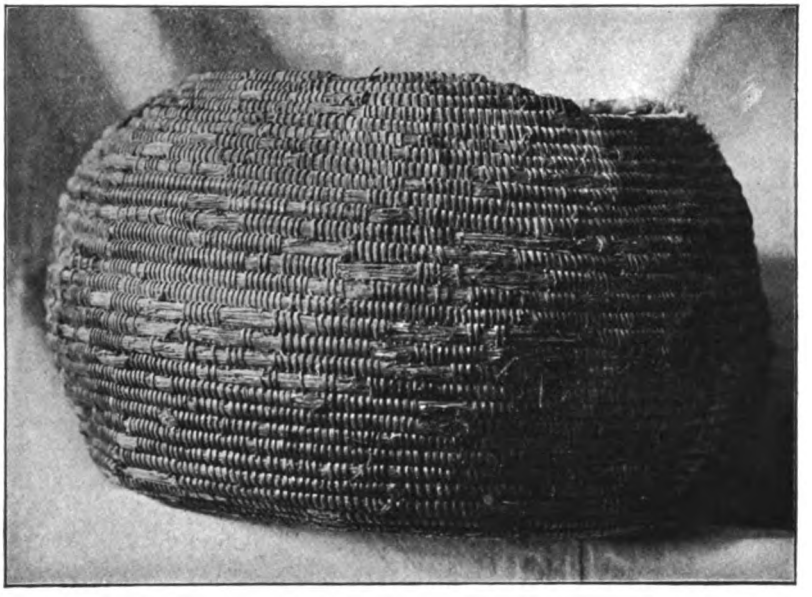


Plate 202. See page 430

ANCIENT COILED BASKETS, FROM SAN MARTIN MOUNTAIN, CAL., IN PEABODY MUSEUM

Photographed by C. C. Willoughby

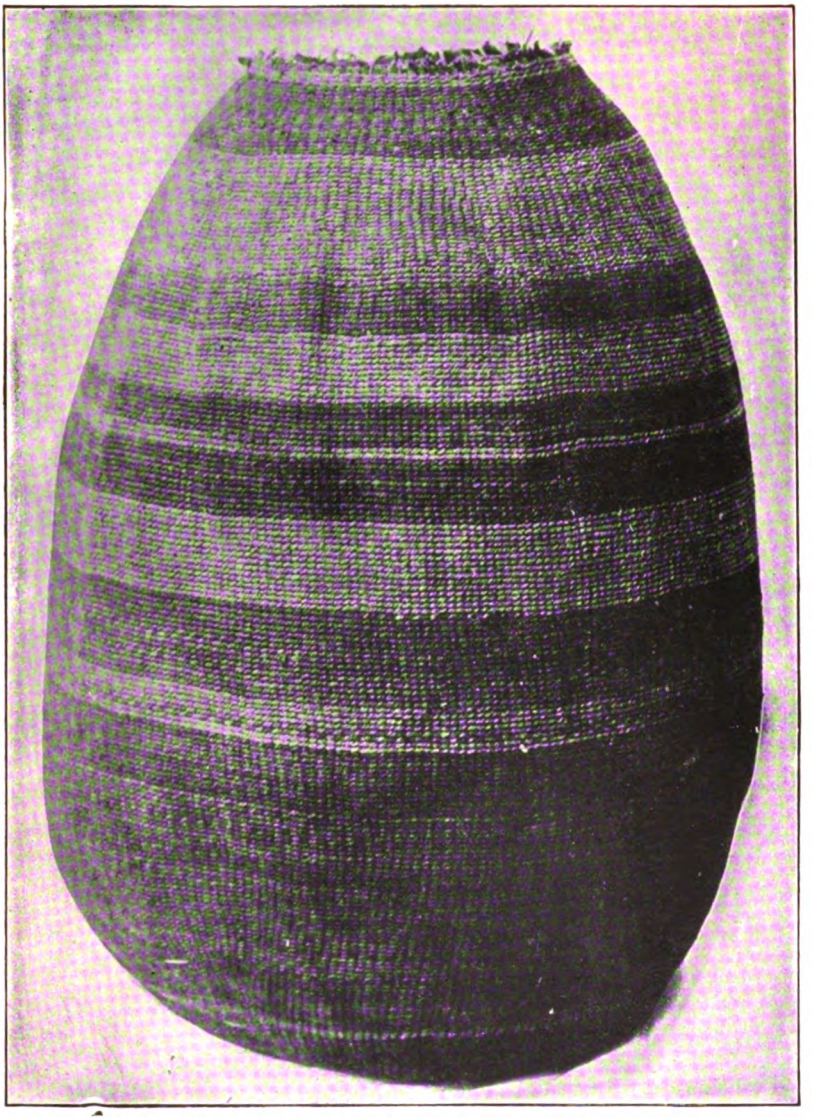


Plate 203. See page 447

RARE OLD TWINED SACK, MESA GRANDE MISSION, CAL.

Collections of U. S. National Museum

Asclepias ascicularis. It is a very ancient piece, the only one that had been seen in those parts. Narciso Lachapa, whose father owned it, says it was old when he was a boy.

The majority of baskets from the Mission region are in coiled weaving. A few examples of twined weaving from this area have been seen in collections, but none equalling this in size and beauty. Its height is 29 inches. Miss DuBois adds that the Mission Indians in the more remote regions wear basket hats, most of them in twined weaving, and others of an older type in coiled stitch. There is an old tale that "two sisters went on the mountain and found little sticks which they wove into baby baskets. They put the babies in and made pillows for their heads. Then the elder sister, who was a witch doctor, held up her hand to the North and received a roughly made basket, which she put on the elder baby's head. Then she held up her hand to the South and received a fine basket, which she put upon the younger baby's head."

The Interior Basin Region

> Not the hands, but reason, teaches mankind arts; but the hands are the instruments of arts, as the lyre is of the musician and the forceps are of the mechanic.—Galen.

Leaving now the Pacific slope, we may examine the basketry of the Great Interior Basin, bounded on the east by the Siouan, Kiowan, and Caddoan families beyond the Rocky Mountains. The Siouan tribes, together with the western Algonquian and other tribes wedged in among them, borrow coiled gambling baskets and substitute the convenient buffalo hide for textiles; but the Caddoan (see figs. 124 and 125) were excellent workers in twilled weaving.

On the north, this basketry area merges into the Fraser-Columbian group, Salishan and Shahaptian tribes chiefly, who are especially skilful in twined work of peculiar types. The soft hat in wrapped twined work, and almost all of the twined wallet overlaid, predominate with the Shahaptian, but the Salish have a wide range of technic.

On the west there is no sharp boundary line, as will be soon shown, the Interior Basin region and the Oregon-California fitting into and invading each other as shore and water line on an irregular coast. This will be especially noticeable with coiled work, the three-rod foundation of California being adopted by some Ute tribes.

The same is true of the southern boundary, the linguistic families dovetailing into those of Mexico. The Apache cross the boundary southward, the Yuman and Piman tribes also reaching northward and excelling in coiled ware with fine grass foundation.

The tribal or ethnic groups in this area are chiefly the Shoshonean and the Athapascan. The first named is a vast linguistic family reaching from near the forty-ninth parallel to Costa Rica; the latter, quite as widespread, extending between 30° and 70° north. Care must again be taken to separate the classific concept of language from that of blood kinship or of arts. Where people live contiguous and have the same speech, their blood becomes mingled as a matter of course. Arts will also be communicated. Especially is this true of the one here considered, being a woman's craft. The Athapascan occupies the southern portion of the Basin, and the Pueblos are most of them in northern Arizona and New Mexico.

Shoshonean and Pueblo Basketry

By far the largest part of the Interior Basin is Shoshonean. The tribes also spread out far to the north in the drainage of the Snake River; have pushed themselves across the Rocky Mountains on the southeast into the drainage of the Gulf of Mexico, and on the western side occupied a large part of southern California, as was shown. The basket-making tribes are the Shoshoni in Idaho; the Ute, with many subdivisions, in Colorado and Utah; the Paiute in western Nevada and California adjoining. As before intimated, both exclusions and inclusions of the term are undefined.

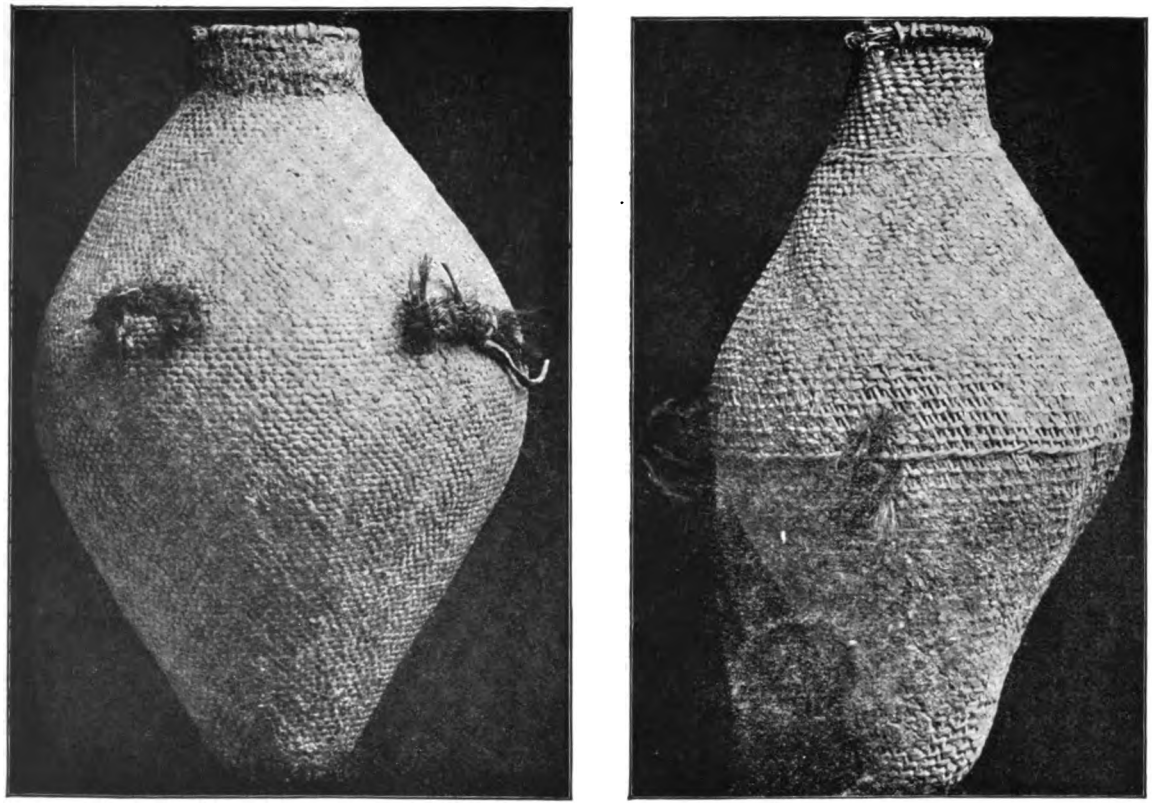


Plate 204. See page 442 WATER BOTTLES IN CLOSE AND IN OPEN TWINED WEAVING, COYUWEE PAIUTE, UTAH

Collections of U. S. National Museum

This great stock of Indians employs both structures, the woven and the coiled. The twined weave of all kinds is used in conoidal basket hats, baskets, jars and bottles, roasting trays, and wands. The coiled and whipped structure is used in pitched water bottles, trays, and bowls. The hat is a conical basket made of splints, the warp radiating from the apex, the woof splints being carried around and twined in pairs, generally in diagonal weave. The woof is not so thoroughly driven home as in softer and more pliant material, but remains open so as to have the appearance of the osier weaving of the East. Simple ornamentation is produced by using one or more rows of red or black splints in elementary geometric patterns.

Roasting trays are shaped like a scoop rimmed with a large twig. The warp is made of parallel twigs laid close together and held in place by diagonal twining. The Shoshonean tribes place seeds of wild plants, with hot stones, in these trays, and thus roast them. Some specimens are much charred on the upper side. (In the Ute country could be seen Indian women gathering seeds in conical baskets, beating the heads of the plants with a spoon-shaped wand toward the basket held in the left hand, with its mouth just under the plants.) These baskets are constructed in every respect like the conoidal hats, and the fans are made of twigs coarsely woven on the same pattern.

The water bottles of the Shoshonean tribes, on the other hand, belong to the coiled and whipped structure. As before mentioned, this style can be made coarse or fine, according to the material, the size of the coil, and of the outer thread. These bottles differ in shape—one class has round bottoms, another long, pointed bottoms; one has wide mouths, another small mouths; one class has a little osier handle on the side of the mouth, like a pitcher; but the majority have one or two loops of wood, horsehair, or osier fastened on one side for carrying. All of them are quite heavy, having been dipped in pitch. The same form is found among the Apache, the Hopi, and the

Rio Grande pueblos, but it is not improbable that they were obtained from the Ute. These bottle-shaped baskets are used for small granaries as well—to hold seeds and keep them away from vermin.

The basket trays of the Ute do not differ essentially in general style from those of the Gila River or California tribes, but they are much coarser. Among the coiled basket trays in the collection accredited to the Ute are indeed two styles, but one of them resembles so much those of their Apache neighbours

FIG. 179.
WOMAN'S HAT.
Ute Indians, Utah.
Cat. No. 11,838. Collected by J. W. Powell.

on the south as to raise the suspicion that they were obtained by barter.

The typical styles here mentioned, as well as interesting variations, will be best understood from examples.

The National Museum has a rare old collection of Ute or Shoshonean material, of which A. H. Thompson writes that of the baskets and other articles of Indian manufacture gathered by the Powell expeditions between 1870 and 1875, the greater part, probably nine-tenths, was secured from the Kaivavits at Kaibab and the Shivwits about St. George, southern Utah, and the Moapas about St. Thomas, southeastern Nevada.

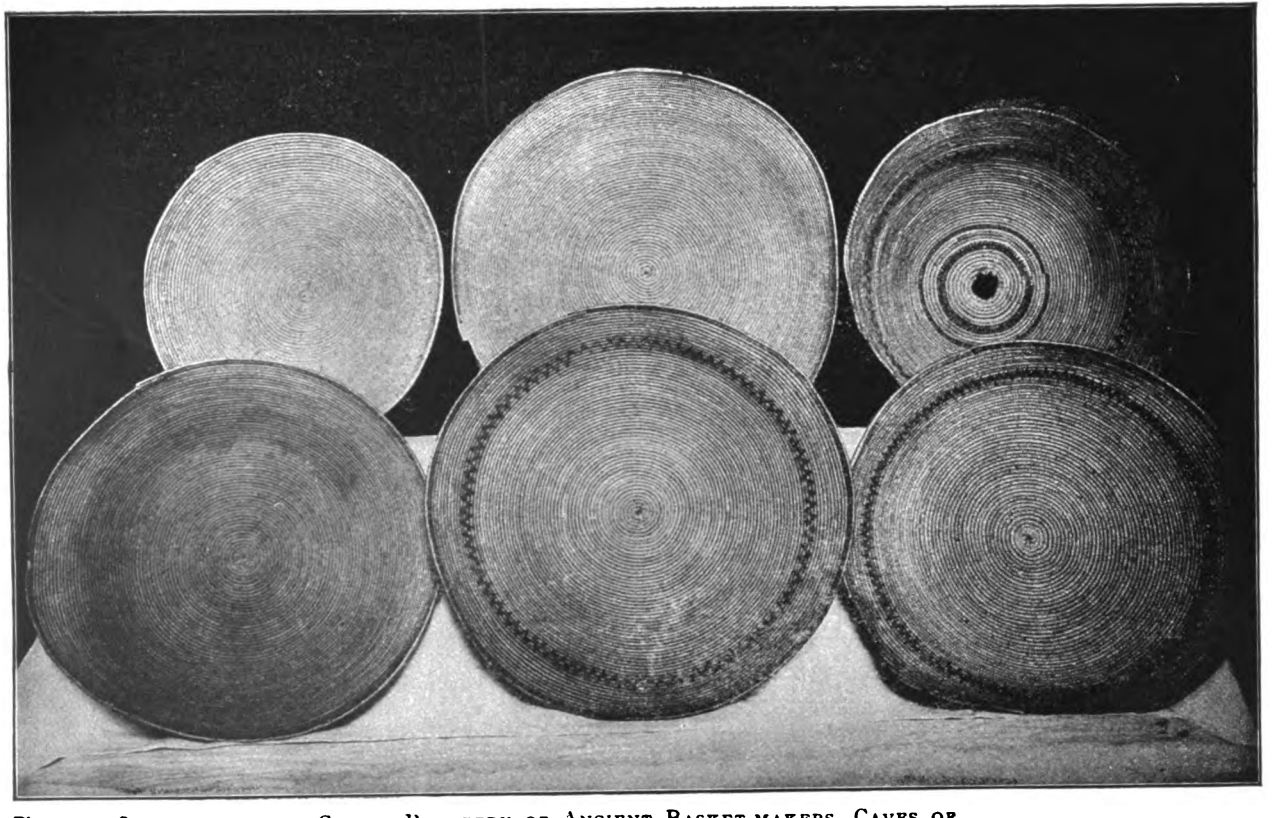


Plate 205. See page 444

COILED BASKETRY OF ANCIENT BASKET-MAKERS, CAVES OF SOUTHEASTERN UTAH

Collections of Am. Mus. of Nat. Hist., N. Y.

These clans all belong to the Paiute nation. (The articles secured from the Ute were from the Gosiute about Deep Creek in western Utah and the Uinta Ute on the Uinta Reservation.) Much of the clothing (buckskin and rabbit fur) and many of the baskets were made by the Indians working under the direction, or rather observation, of Mrs. E. P. Thompson, the endeavour being to have the work done by the methods employed before the coming of the whites and by the older people of the clans.

FIG. 180.
HARVESTING FAN.
Paiute Indians, Utah.
Cat. No. 11,823, U.S.N.M. Collected by J. W. Powell.

Fig. 179 is a hat of a Ute Indian woman, in diagonal twined work. The warp stems converge at the top, and additional ones are added as the texture widens. The weft splints are twined so as to include the vertical warp twigs in pairs. On the next round the warp elements are again inclosed in pairs, but not in corresponding ones to those of the row underneath. The lines of the weft elements ascend diagonally, and a twilled effect is produced on the surface. This form of twining must not be confounded with three-ply twine around the border, which has a somewhat similar appearance, but is so close that the warp stems do not show. The border of this Ute basket is ingeniously made. First, the projecting warp elements are bent and whipped in place with splints, to form the body of the rim; on the top of this the weaver sews an ornamental false

braid, catching the splint into the bent warp stems underneath. The ornamentation on the outside is produced by three-strand monochrome or dichrome weaving. The Utes are skilful in various methods of technic, but the materials in which they work are coarse and rigid, giving a rough appearance to the surface. The hats are used also as receptacles, so that the terms top and bottom are only relative to function.

Fig. 180 is a harvesting fan of the Paiutes, made of small stems, split or whole, and bound together with various fibers,

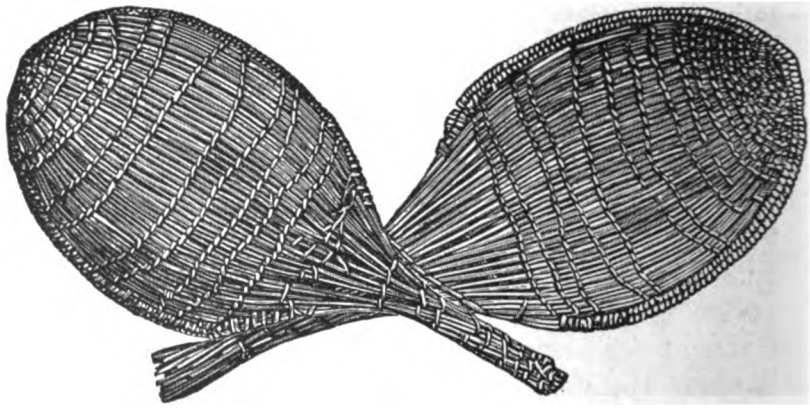


FIG. 181.
HARVESTING FANS.
Paiute Indians, Utah.
Collected by J. W. Powell.

the manual portion being wrapped with softer material. This very coarse specimen is represented in other tribes, especially on the western side of the Sierras, by finely woven, spoon-shaped harvesting wands. It is Catalogue No. 11,823 in the United States National Museum, collected in Utah by J. W. Powell.

Fig. 181 is a pair of harvesting fans of the Paiute Indians in southern Utah. A bundle of rods is fastened together to form the grip of the fan; the other ends of these rods are then spread out, and afterward brought together to a point, at

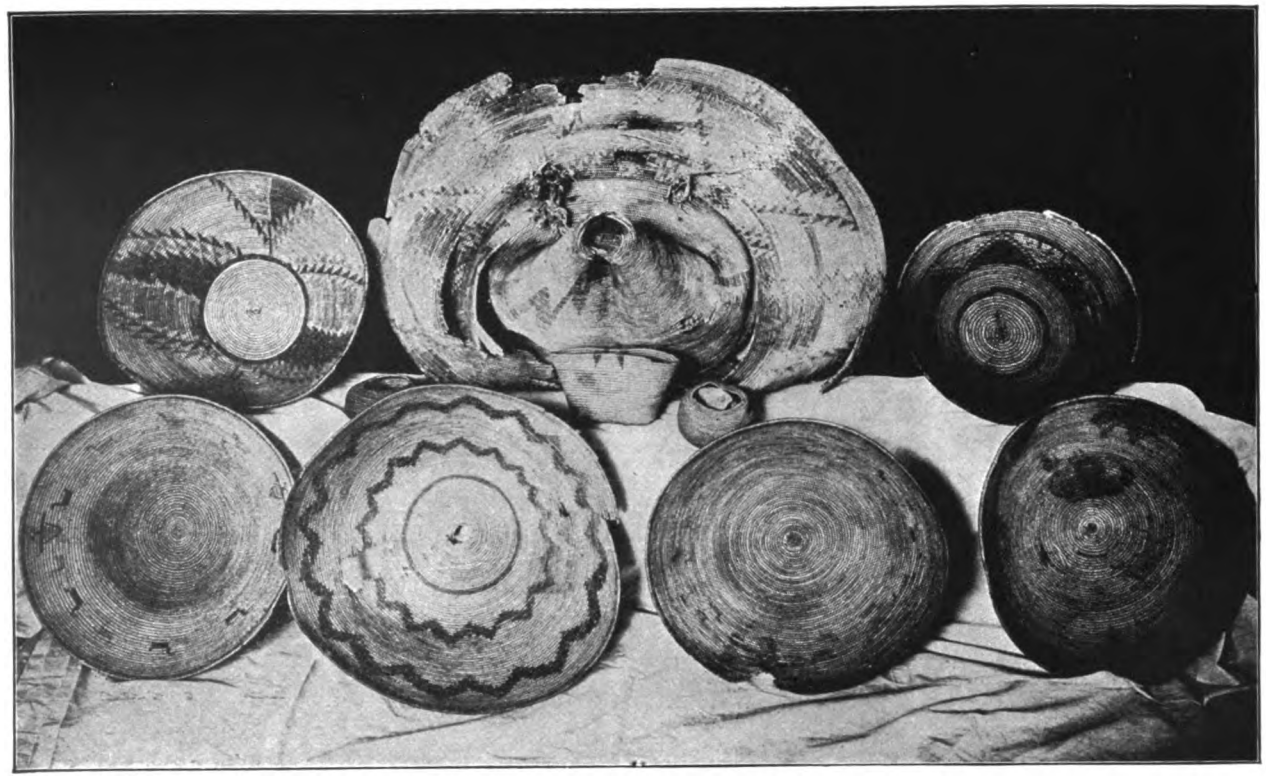


Plate 206. See page 444

COILED BASKETRY OF ANCIENT BASKET-MAKERS, CAVES OF SOUTHEASTERN UTAH

Collections of Am. Mus. of Nat. Hist., N. Y.

the same time bent downward in spoon form for a warp. These are held in place by a continuous twined weaving backward and forward, the rows being at irregular intervals. Near the end, the points are held together by compact twined weaving. The border is made by coiled work built up on a pair of strong rods. These interesting objects are not confined, as will be seen, to the Ute Indians, but all the tribes in California, Nevada, and Arizona that depend upon the smaller seeds for their sustenance have the same method of beating the ripe grass into a conical carrying basket. The fans of this type, perhaps, form the very earliest harvesting device.

Associated with the harvesting fan is the gathering and carrying basket and the roasting or winnowing tray.

FIG. 182.
GATHERING BASKET.
Paiute Indians, Utah.
Cat. No. 14,688, U.S.N.M. Collected by J. W. Powell.

Catalogue Nos. 11,817 and 11,822 in the United States National Museum, procured in Utah by J. W. Powell.

Figs. 182 to 184 illustrate a gathering basket of the Paiute Indians. The first, fig. 182, represents the entire structure, which is at basis open twined work. The noticeable feature about this piece is the treatment of the warp, which, instead

of rising perpendicularly from the bottom to the top, is twisted to the left, each radial element of the warp making about one-fourth of a turn from the vertical. Again, the technic is diagonal weaving in twined work. The diverting of the warp from the vertical is not common in twined weaving, but occurs quite frequently in this area and among the Shoshonean family.

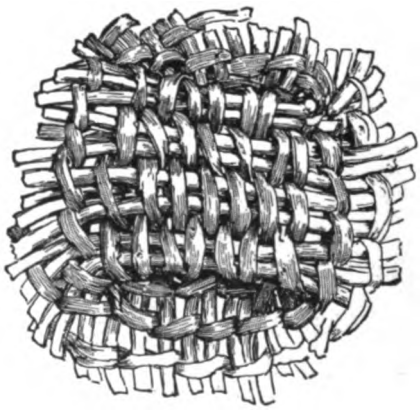


FIG. 183.
BOTTOM OF FIG. 182.

Fig. 183 gives a good notion of the way in which the bottom is started. Four pairs of warp stems constitute the base. These are held in place by very coarse twined weaving. The ends of the stems are bent to become the warp of the body. The upper border of the basket shows how the warp stems are bent down to the left; a bundle of splints laid on top and sewed as in coiled weaving (fig. 184). On the top of this a stout rod is sewed by another turn of the same process, so that both coiled work and twined work are to be seen in this coarse bit of everyday ware.

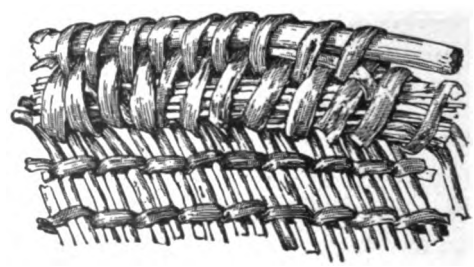


FIG. 184.
BORDER OF FIG. 182.

This specimen, Catalogue No. 14,688 in the United States National Museum, was collected in Utah by J. W. Powell.

Fig. 185 is a harvesting and carrying basket of the Paiutes in diagonal twined weaving, precisely as in fig. 179, representing a Ute woman's hat, and fig. 180, the fanning tray.

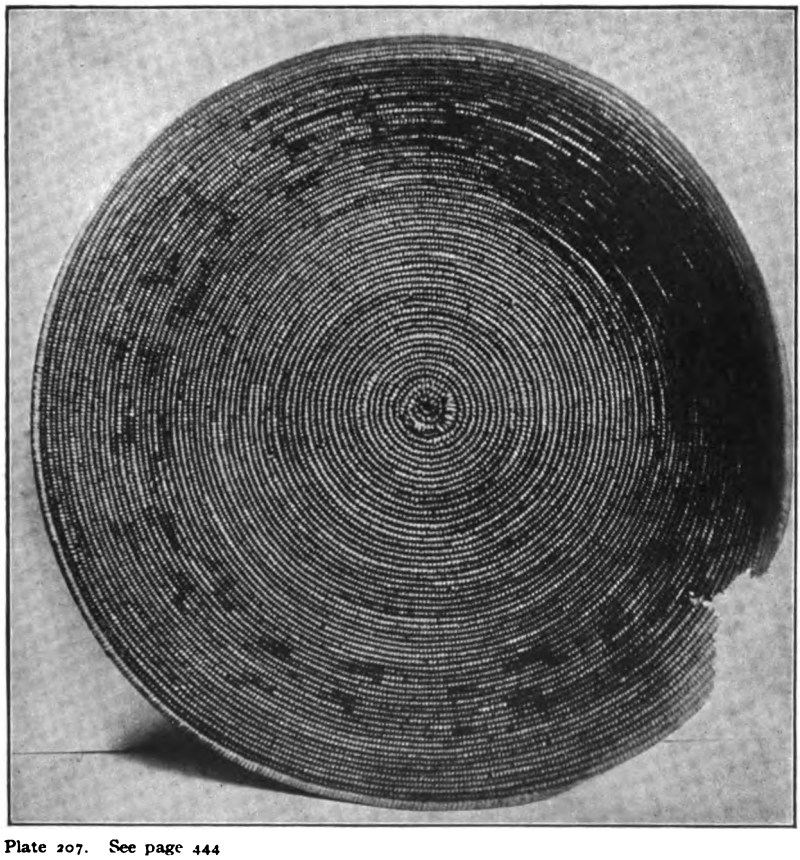


Plate 207. See page 444

COILED PLAQUE OF THE ANCIENT BASKET-MAKERS, CLIFFS OF SOUTHEASTERN UTAH

Collections of Am. Mus. of Nat. Hist., N. Y.

The bottom is covered with hide to protect it, and on the body is fastened a head band used in carrying. The ornamentation on many Ute specimens seems to have been effected by charring, since the figures do not appear on the inside at all.

The Ute Indians make use of many kinds of seeds in their dietary. The women go out into the plains with this carrying basket and the fan, illustrated in Fig. 181. The apex of

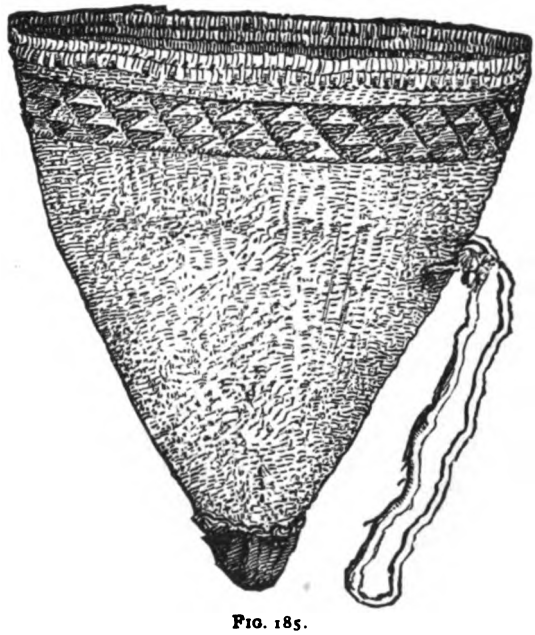


FIG. 185.
CARRYING BASKET.
Paiute Indians, Utah.
Cat. No. 14,667, U.S.N.M. Collected by J. W. Powell.

the carrying basket is rested on the ground, and the seeds are beaten into it by means of the gathering fan. When the basket is full, the woman places the band across her forehead, rests the receptacle on her back, and trudges home with her load.

Catalogue Nos. 14,667 to 14,746 in the United States National Museum were procured in Utah by J. W. Powell.

Fig. 186 is called a roasting or fanning tray of the Paiutes,

turn passes around the foundation only; at the next it is drawn under the rod in the coil below, and returning is wrapped about itself or "the standing part," as the sailors say. The ordinary Japanese lunch baskets, Samoan basketwork, and those from the Strait of Magellan are on the same plan. But it is certainly a rare sight in this part of the world.

Plates 205 and 206 are from the Pepper collection of coiled basketry from the caves of the ancient Basketmakers. The particular specimens will be described under separate photographs of each one, but the group shows both the forms and functions of the material gathered at this interesting locality in southeastern Utah.

Plate 207 is a coiled tray, having as design two circles of figures resembling aquatic birds floating on the water. This is an excellent opportunity to speculate about the relation of this desert region with prayers to the water god.

Plate 208 is another coiled tray from the cave-dwellers, with an ornamental design, showing two sinuous rings in black.

Plate 209 contains two bowls apparently with the three-rod coil, such as is now common among the best basketmakers of California. The ornamentation is also suggestive of the same locality. On the upper figure are four radial designs triangular in outline, two having their bases at the bottom and two on the outer border, each pattern made up of fringe-work of triangles, reminding one of the strings of arrowhead patterns mentioned by Dr. Dixon in his pamphlet on the Maidu. The lower figure is similarly constructed in coiled weaving, the ornamentation being in circular patterns; the bottom is plain; then follow narrow rings in black, a broad ring in white, a broad band with seven triangular rays, a narrow band in black, and a broad band in the natural colour of the wood.

Plate 210 is interesting as showing the function of the baskets which were found in the Utah cave. All of them have relation to food. They are in twilled and coiled weav-

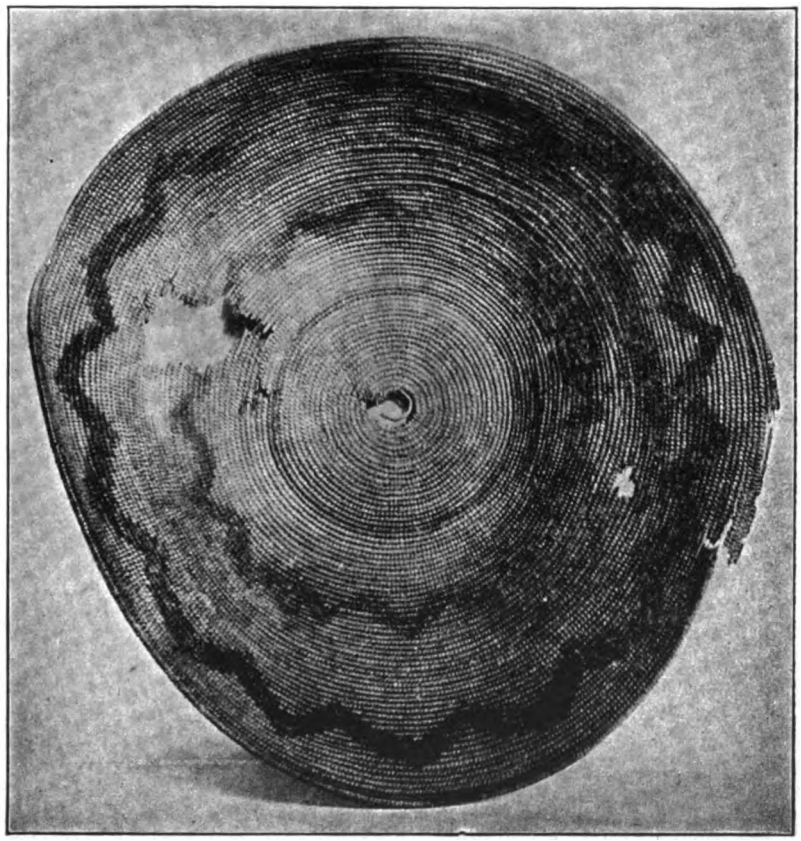


Plate 208. See page 444

COILED BOWL OF THE ANCIENT BASKET-MAKERS, CLIFFS OF SOUTHEASTERN UTAH

Collections of Am. Mus. of Nat. Hist., N. Y.

ing, and show how in ancient times the basket entered into the service of these agricultural Indians.

Plate 211 shows a mortar basket of the ancient basketmakers in coiled weaving on splint foundation. It is not possible to determine the material of the stitches. It is 13 inches in diameter and 3½ inches deep. The interior is coated with meal, and the surface of the sewing is worn through from long use. Mortar baskets are common among the California tribes, both in twined weaving and in coiled work. A specimen quite similar to the one here shown in the United States National Museum has a coiled basket top, cemented to the shallow mortar stone underneath by means of pitch. The specimens are in the collection of the American Museum of Natural History.

Pepper describes four varieties of sandals among the ancient Cliff-dwellers—thin soles in twilled weaving from narrow leaves of yucca; those made of broad leaves split; a padded variety made from the same leaves shredded; and an exceedingly fine kind, of spun fiber and worked into elegant patterns. In these last the warp is in two or more layers or plies, so that the body is thick and durable. He quotes Richard Wetherill to the effect that while the chamber-building Cliff-dwellers wove the sandal with pointed toes and a jog or step a few inches from the toe, those of the Basketmakers were square in front. McLoyd and Graham assert that square-toed sandals were made by the people that inhabited the underground rooms, since they are found only with mummies of that race. No square-toed sandals are found in caves where remains of the Basket Makers do not exist. From their variety of weaving in soft materials, the Cliff-dwellers are to be traced to Mexico for their origin.

The term Pueblo basketmaker is far from specific. It applies to women of all the settled villages in New Mexico and Arizona, from Taos on the Rio Grande, in the former, to the Hopi in the latter. The peoples belong to the Tañoan and

Keresan families on the Rio Grande, to the Zuñian in western New Mexico, and the Hopean or Shoshonean in Arizona.*

Far back in time those structures whose ruins furnish inexhaustible supplies of pottery and some textiles have also to tell the tale as to the ancient types of basketry. At the present moment, great confusion exists concerning the ethnic significance of basketry found in the pueblos. Beautiful old pieces, about which there is little information, came twenty years or more ago from these villages. James Stevenson wrote then that the women of the villages were fond of securing in trade and hoarding rare forms and weaves. The best that can be now done is to classify Pueblo basketry as follows:

(1) What the women are actually making and old material precisely like it.

(2) Specimens dug from sites of old pueblos and carefully labelled.

(3) Old materials stored up in the modern pueblos, handed down from the past, whose authorship is not known.

If all this material could be assembled, a variety of technical processes would be revealed, some of them common over wide areas and a few characteristic of the pueblo culture. The following weaves are among the list:

(1) Checker weaving, rare.

(2) Wicker weaving, coarse and fine.

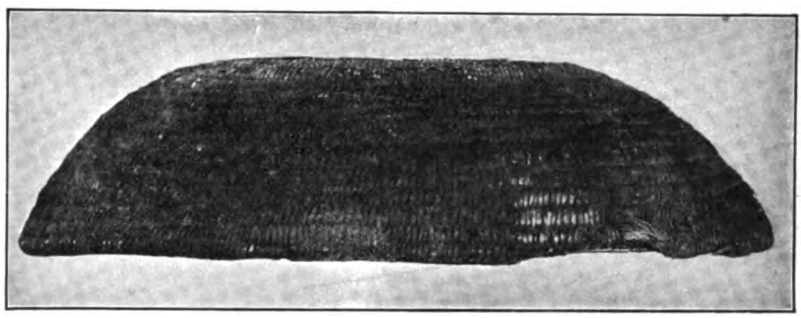
(3) Twilled work, in hard stems and in yucca.

(4) Twined work of many kinds on old baskets. Thought to be intrusive.

(5) Coiled work with foundation of stems, splints, grass, and shredded leaves.

The fine wicker and the thick coiled plaques are peculiar. The great variety mentioned is quite as much between pueblos as between these and tribes outside. The Hopi are note-

* For a list of pueblos, see Seventh Annual Report of the Bureau of Ethnology, under the words Keresan, Shoshonean, Tañoan, and Zuñian; for ruins, see bibliography under Fewkes, Hough, Keam, Mindeleff.



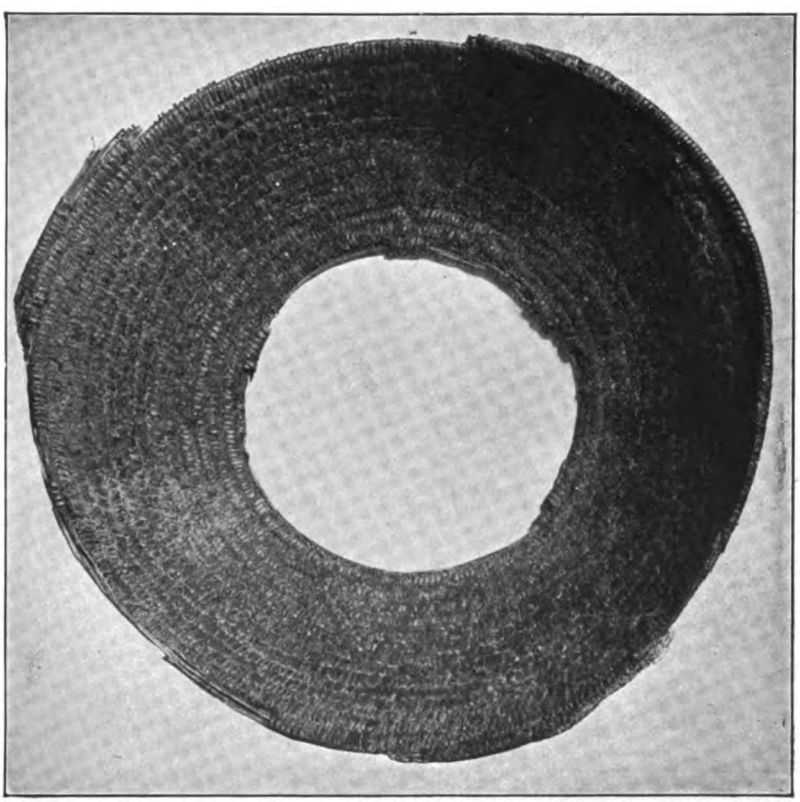


Plate 211. See page 445

HOPPER FOR MORTAR, ANCIENT BASKET-MAKERS OF CLIFFS IN SOUTHEASTERN UTAH

Collections of Am. Mus. of Nat. Hist., N. Y.

Plate 212. See page 447

SIA ANCIENT COILED BASKETS

They are among the rarest of baskets, and are like those which have been found in the cliff house ruins

Collected by James Stevenson

worthy in this regard, having in their hands the making of the two unique kinds of weave in their sacred meal plaques. A better insight into these differences will be gained by an examination of specimens.

Plate 212 represents two ancient coiled basket jars collected at the pueblo of Sia, on the Jemez River, a tributary of the Rio Grande in New Mexico. The Indians of this pueblo belong to the Keresan family. The characteristics to be observed and studied on these specimens are the following: The foundation is of splints, the sewing is done with willow or rhus, and the stitches are just barely carried around a small portion of the foundation underneath, where they are interlocked. Note also that the ornamentation—an ascending spiral—is in one case a rhombic figure and in the other is built up of little rectangles formed by counting stitches, which may be few or many, as the curve on the body of the basket expands or contracts. This mingling of very simple elementary forms is capable of an infinite variety in treatment.

The attention of the student is especially called to the margins of these baskets, which appear to be in a three-strand plait; but they are really done in a single splint which passes backward over the foundation, then under and forward, inclosing the rod underneath, forming a figure 8, and the multiplication of this produces on the surface the braided appearance. For detail, see page 126, fig. 87. Catalogue Nos. 134,214, 134,215. Collected by James Stevenson.

Although there may be seen at the pueblo of Zuñi all sorts of baskets, the most of them include pitched bottles for water, coiled and whipped trays, Hopi coiled and water basket trays; but it is not to be understood that they were necessarily made there. The only work made by the Zuñi nowadays is their small, rough peach baskets of twigs and wickerwork, hardly worthy of notice except for their ugliness and simplicity. Those who are familiar with this interesting tribe of Indians say that trading is a passion with them, and that through

their agricultural products and their refined loomwork they are able to gratify among the surrounding tribes this taste for old basketry, examples of which are stored away, and brought out on special occasions.

Plate 213 shows some old so-called Zuñi ware, collected for the Bureau of American Ethnology by James Stevenson, in New Mexico, long ago.

Fig. 1 is a wicker basket of globular form. The warp consists of a number of stems of *Chrysothamnus* laid flat. The weft of the same material is in wickerwork, the border being fastened down in coiled sewing with yucca leaf. Handle, a rawhide thong. Used by these Indians in gathering fruit and other food substances. Height, 8 inches. Cat. No. 68,603, U.S.N.M.

Fig. 2 is a jar-shaped basket of *Chrysothamnus* (*Bigelovia*) splints. The warp is radiating at the bottom and parallel on the body; the whole basket is made in twilled style of twined weaving over two. The border is not finished off. The handle is a rawhide thong around the neck. This is a very coarse specimen of twined work. The height is 8 inches. Cat. No. 68,480, U.S.N.M.

Fig. 3 is a rare and interesting specimen of a twined basket jar. The bottom has radiating warp and is in coarse twilled weaving, but the body from the bottom to the upper margin is plain, twined weaving, without variation. There is not in the National Museum collection from this Pueblo region another basket in which the whole body is treated in this monotonous manner. Its height is 8½ inches. Cat. No. 68,513, U.S.N.M.

Fig. 4 is a water-tight jar from the Zuñi Indians. The whole surface of the object is in the twilled type of twined weaving and well saturated in pitch. The characteristic features are the lugs of wood on the side for the carrying strap, and flattening of the surface between these lugs, as in a canteen. This is partially shown in the photographs, but is quite

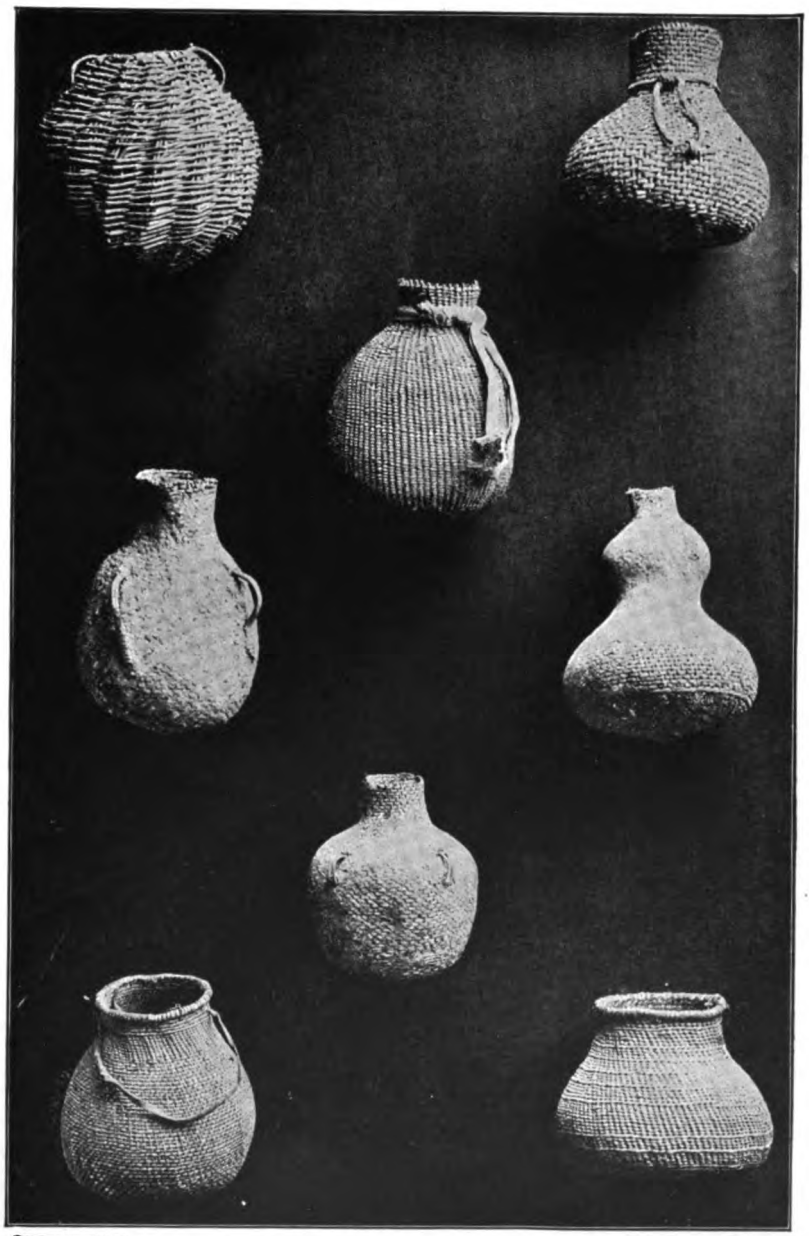


Plate 213. See page 448

OLD WICKER AND TWINED BASKETS FROM THE PUEBLO OF ZUNI, NEW MEXICO

Collections of U. S. National Museum

1 2 3 4 5 6 7 8

apparent on the jar itself. Its height is 9 inches. Cat. No. 68,515, U.S.N.M.

Fig. 5 is a water-tight basket jar, constricted in the middle for the attachment of a carrying strap. The whole surface is in coarse twilled weaving in two-strand twine with the exception of one row between the bottom and the body, which is in three-strand. The constriction of the body is said to be an imitation of a custom of tying rag around the young gourd so as to stop its growth, which results in a modification useful for holding the carrying strap. Its height is 9 inches. Cat. No. 68,541, U.S.N.M.

Fig. 6 is a water-tight basket jar, from the Zuñi Indians, symmetrical in outline. It is in the twilled type of twined weaving, with wooden lugs on the side and no flattening of surface between them. Its height is 7½ inches. Cat. No. 68,502, U.S.N.M.

Fig. 7 is a gathering basket from the Zuñi Indians. The weaving on the bottom and the body is in the twilled type of twined work; the neck, on the contrary, has about an inch of plain twined weaving, and is finished off with four rows of three-strand twine. The border is in coiled sewing of yucca. This specimen, like the preceding, is made from the stems of *Chrysothamnus*. Its height is 7½ inches. Cat. No. 68,491, U.S.N.M.

Fig. 8 is a gathering basket from the Zuñi Indians. The bottom is in twilled twined work; the body is in plain twined work relieved at varying distances with single rows of three-ply weaving; border finished off with coiled work in yucca. Its height is 6 inches.

The Zuñi pueblos in western New Mexico lie in the very heart of the desert region. On the east are the Rio Grande pueblos, on the northwest the Hopi, and far to the south the Gila River. Besides the settled communities long inhabiting this region, the Navaho and Apache are close at hand on every side, and the Utes not far away. There is no surprise, there-

fore, in finding on the same plate illustrations of wickerwork, twined work in its many varieties of plain twilled and three-strand work, and all of these at times on the same piece of basketry.

Plate 214 shows a rare lot of old coiled baskets, chiefly from Zuñi and Sia, in New Mexico, collected under the direction of Major J. W. Powell, by James Stevenson, of the Bureau of American Ethnology. They appear to be of the three-rod variety, though splints may take the place of rods in some of them. They are catalogued as follows, in the order named:

Top row—

1. No. 68,471, Zuñi, James Stevenson; length, 9½ inches.
2. No. 68,550, Zuñi, James Stevenson; height, 4¼ inches.
3. No. 68,474, Zuñi, James Stevenson; height, 7 inches.
4. No. 68,472, Zuñi, James Stevenson; height, 4¾ inches.
5. No. 42,140, Zuñi, James Stevenson; height, 4¼ inches.

Bottom row—

1. No. 68,489, Zuñi, James Stevenson; height, 4¾ inches.
2. No. 166,800, Apache, James Mooney; height, 8¾ inches.
3. No. 134,215, Sia, James Stevenson; diameter, 11½ inches.
4. No. 134,214, Sia, James Stevenson; height, 12 inches.
5. No. 42,168, Zuñi, James Stevenson; height, 4 inches.

A jar-shaped coiled basket attributed by the collector to the Zuñi Indians is shown in fig. 189. It is a very beautiful and smooth piece of coiled ware, to which justice is not done by the drawing. In regularity of stitch, symmetrical shape, and ornamentation it is almost without fault. It belongs to the class of technic termed in this treatise rod and welt. The foundation consists of a single rod, over which is laid a thin splint, perhaps of the same material. The stitch passes over rod and welt in the row that is in progress of manufacture, and not only locks with the stitch underneath, but in each case takes up the welt. This forms an excellent packing. The stitches are crowded so closely together that in the original

Plate 214. See page 450 OLD COILED BASKETS, PUEBLOS OF ZUNI AND SIA, NEW MEXICO

1 2 3 4 5
6 7 8 9 10

Collections of U. S. National Museum

Plate 215. See page 453

HOPI WOMEN MAKING WICKER AND COILED BASKET TRAYS

Photographed by W. H. Simpson

those of the different rows lie practically one over the other, with a slight inclination from the perpendicular. On the bottom, not shown here, it has a circle in black from which radiate six spiral rays. On the body, the ornamentation is as shown

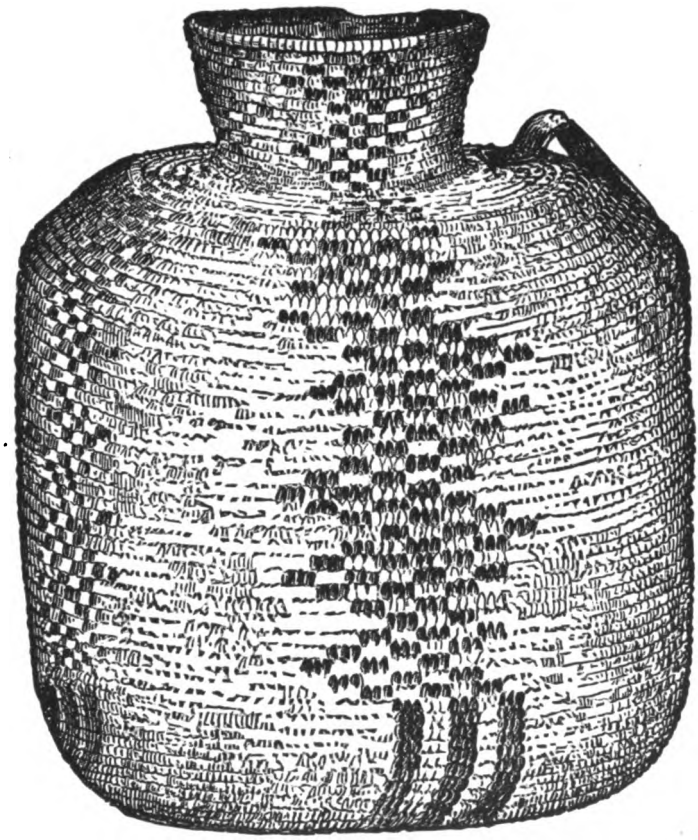


FIG. 189.
COILED BASKET JAR.
Zuñi Indians, New Mexico.
Cat. No. 68,546, U.S.N.M. Collected by J. W. Powell

in the figure. It is made from the pod of *Martynia louisiana*. On the shoulder, two lugs of leather are sewed for the purpose of carrying the jar, being intended, doubtless, for the transportation of food or water. It is customary to attribute such ware to the Apache Indians, although in the National

Museum there are quite a number of very old coiled jars of this type and fine workmanship purporting to come from the Zuñi Indians. This specimen was gotten by Major Powell, one of the most careful collectors, so that there is no doubt as to the location. It is possible, however, that the Zuñi, since they are potters, may have acquired this coiled specimen in traffic.

The detail of this texture, both in its sewing and ornamentation, is illustrated in fig. 48, also by Cushing.*

This specimen, Catalogue No. 68,546 in the United States National Museum, was procured in New Mexico by James Stevenson. Its width is 9 inches and depth 10 inches.

The Hopi pueblo settlement, called also Moki, in the ancient province of Tusayan, is made up of the following-named villages, in order from east to west: Walpi, Hā'no or Tē'wa, Sichōmōvi, Shipaulovi, Mŭshŏngŭnŭvi, Shumōpavi, and Oraibi. Here in these seven old towns are made all kinds of basketwork. From Dr. Walter Hough the following information is received: The thick North-African-like coiled plaques are from Mŭshŏngŭnŭvi Shipaulovi, and Shumōpavi, all on the middle mesa, and nowhere else in the Western Hemisphere. The material for the foundation is stems of Takashu (*Hilaria jamesii*), gathered in October. The sewing is done with narrow strips from the leaves of Mohu (*Yucca glauca*) in the natural colour of the outside or the interior, or nowadays dyed in aniline colours. Formerly vegetal dyes were employed, red brown Ohaushi (*Thelesperma gracile*); dark blue from seeds of Akaushi (*Helianthus petiolaris*); yellow from Asapzrani (*Carthamus tinctorius*); green or blue, rarely seen on old baskets; but from Mrs. Hough comes the delightful information that the Hopi make a native blue dye from the beans which they raise for food. The following are their terms for basketry:

Apa, blanket mat. (Anciently made in checker weaving.)
Chu ku pō eta, also Chu ku bŏt se buh, Havasupai.
Shio eñ ya puh, Oraibi wicker tray.

* Fourth Annual Report of the Bureau of Ethnology, 1886, p. 486.

Plate 216. See page 454

HOPI SACRED COILED PLAQUES

In which the symbols are reduced to the lowest terms

Collected by James Mooney

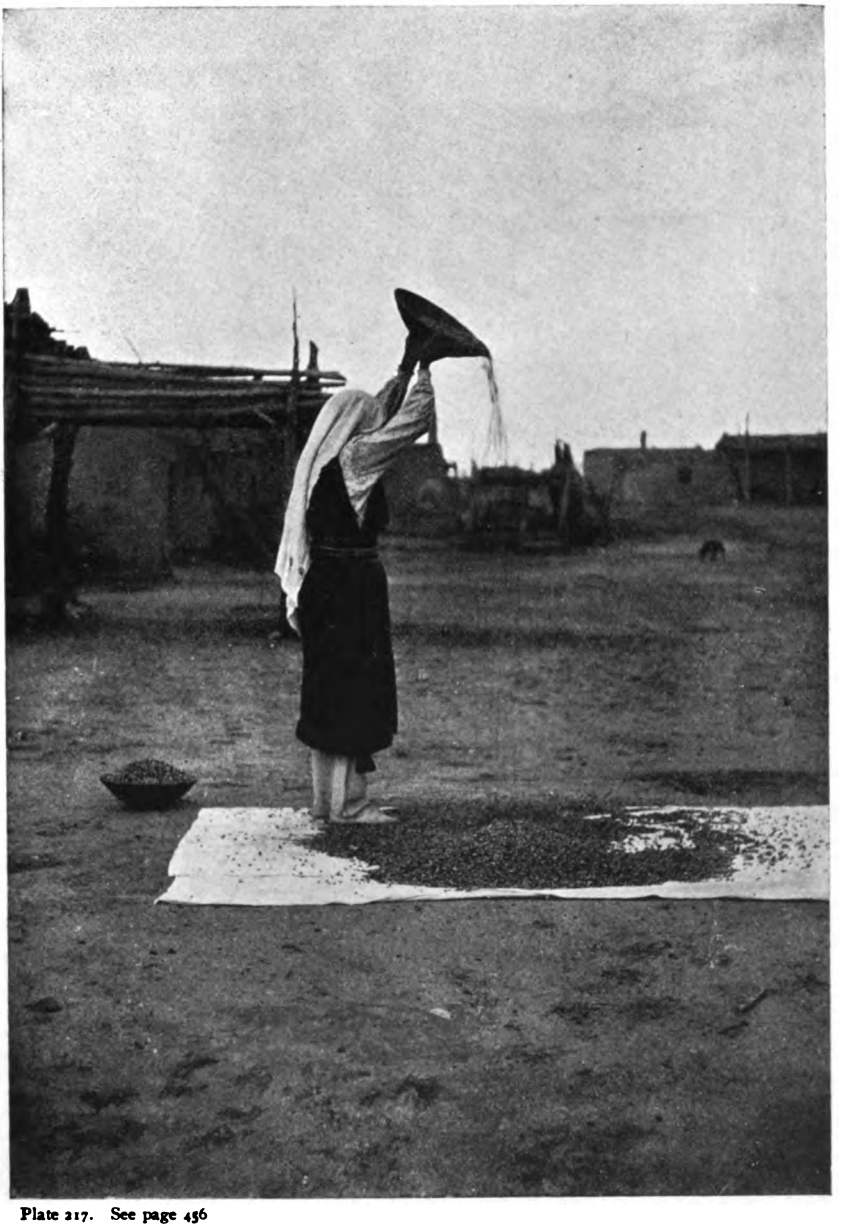


Plate 217. See page 456

TEWAN PUEBLO WOMAN, ON THE RIO GRANDE, WINNOWING SEEDS

Photographed by A. C. Vroman

Plate 218. See page 456

OLD TWINED AND COILED BASKETS FROM THE HOPI PUEBLO OF ORAIBI, ARIZONA

Collections of U. S. National Museum

Du tsi ye, or Du tsai ya, sifting basket.

Hō a pūh, carrying basket (wicker over frame of bent sticks crossed).

Kŏm che, awl of bone.

Hush tush shum pi, or Ko tuc, basket for parched corn.

Kwakū ütshpi (hay cover), twined mat for kiva hatch.

Pek ech be, piki tray (food tray).

Pō eta, basket plaque (coiled).

Se boch be (Oraibi basket).

Tümni, flat basket in Soyalana rites.

Wiko zhro, pitched bottle.

Plate 215 represents Hopi women making coiled and wicker baskets. Photographed by W. H. Simpson. Figured and coloured examples of their ware are shown in Plates 16, 27, 30, 47, 85, 93, and 216.

Wicker baskets are made at the Hopi pueblo, Oraibi. The radiating framework is of slender shoots of sübi, *Rhus trilobata*. The interwoven element is of branches of hanoshivapi, *Chrysothamnus graveolens*, also called *Bigelovia*, carefully smoothed and dyed, as in the coiled baskets, red brown, red, yellow, dark blue, purple, green, blue, and white, the latter with kaolin.

The white of the background is applied after the basket is finished. The edge of the basket is finished with a winding of yucca over the several rods of rhus bent down after the basket has reached the size required. This edge is often painted with red ocher (Hough). The framework consists of two cross sets of twigs, four or more in a bar of the cross. These are firmly held together at their intersection by weaving. They are then spread out radially, the space being from time to time supplemented by additional stems. The worker provides herself with bunches of white, yellow, orange, purple, black, blue, and green twigs only a few inches in length. These she proceeds to weave into patterns of the greatest beauty, even imitating cloud effects seen on Japanese screens, using long or short twigs as the occasion

demands, hiding the ends between the ribs and the filling of the preceding coils. (See Plate 216.)

The variety of ornament created with these poor appliances is marvellous. In no other tribe of Indians and in no other type of basketry are more striking effects realised. It seems almost as if the women had set themselves the problem of producing with the least pliable materials the most versatile of effects, in which are embodied the symbols of an intricate ritual, in all grades of symbolism from the pictograph to the mere conventional mathematical form. Both, however, represent the same ideas. It will be easily seen that the figures on the back and front do not exactly conform, the corresponding square on the back being always one space to the right or left of the same in front.

Attention is called at this point to the ornamental beginning of the wicker plaque, or sacred meal baskets. In the chapter on structure, attention is directed to the methods of holding the central warp stems together before bending them apart radially. Two methods are resorted to. On one, half a dozen or more stems are laid side by side and wrapped together by a process shown in fig. 38, after Miss White. The same number of stems are similarly joined and laid under this at right angles, the whole twelve being bound together by one or two rows of wicker weaving. From this central point, the twelve or more wrapped stems are bent apart at equal distances and the regular wicker weaving proceeds. At a certain distance outward, new warp stems are added between each pair of those already in use, and from this circle the weaving proceeds to the margin.

With the same number of warp stems, quite a different process is sometimes employed, by which the two sets of the upper and lower are held together in pairs by wicker weaving, and at an inch from the center the whole series are bound together as before and widening and weaving proceed in the same manner.

Fig. 190 is a coarse wicker tray of the Hopi Indians of northeastern Arizona, and is introduced for the purpose of illustrating the method in which the much finer work on the sacred meal trays is done. Here may be seen the plan of starting out with a few stems crossing each other at right angles for warp; the method of hiding the large end of the weft stems to become a portion of the warp, and the method of adding new

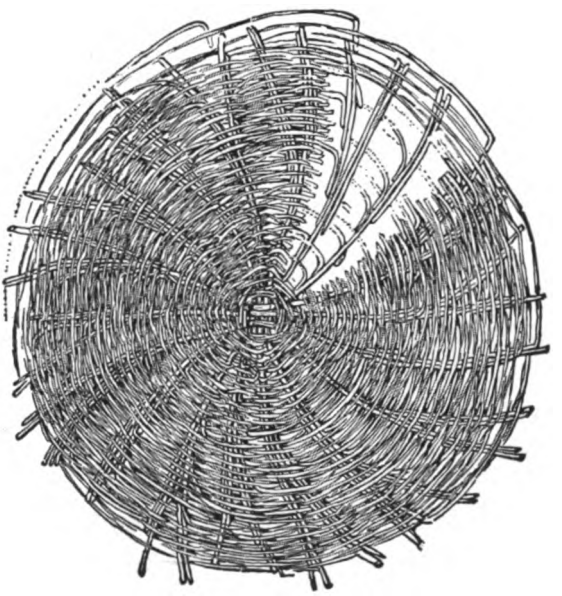


FIG. 190.
COARSE WICKERWORK.
Hopi Indians, Arizona.

warp stems as they are needed. Especial attention is called to the way in which several stems for weft are introduced at the same time and worked along in sets or series. The common method of working out the twill would be to introduce a weft stem, carry it as far as it would go, and then insert a new one; but in this case the series of half a dozen stems are all worked at the same time. Compare description of a Mexican wicker basket, on page 484.

The modern twilled basketry is as rough as it can be. The

same is true of the flat mats used about the dwellings; in fact, the mat and the basket are identical in weaving. The basket is formed by bending the mat over the edge of a hoop and sewing down with a row of twined weaving.

Plate 217, in the graceful pose of the actor, reminds one of the vestal Tuccia. In this picture she is a pueblo woman of the Tewan family, living on the Rio Grande and cousin to the people of the most eastern Hopi pueblo. She is a survival of the gleaners and winnowers of primeval times. Interest here centers in her baskets, one of which is a receptacle, the other a primitive fanning mill. Photographed by A. C. Vroman.

The twined ware of the Hopi are a few baskets and other domestic utensils, made in the same manner as the Ute hats, but there is enough dissimilarity of form to give the Hopi the credit of inventing this peculiar style. (See Plate 218, figs. 4 and 7.)

Plate 218 shows a collection from Oraibi, the westernmost of the Hopi pueblos in northeastern Arizona, gathered by Colonel James Stevenson and Cosmos Mindeleff. The three types of work always in mind when Oraibi and the pueblos of the adjoining mesa are mentioned, to wit, twilled, thick coils, and wicker, are utterly wanting in these examples. The cosmopolitan character of the Hopi is attested by the varieties of technic in the plate. The baskets on the upper row are as follows, from left to right:

1. Water-tight coiled jar, with foundation of rods, sewing material of willow splints, the stitches interlocking, but not taking in any of the foundation below. Catalogue No. 42,109 in the United States National Museum. Height, 7½ inches. The lugs on the side are of horsehair.

2. An old flat coiled dish, No. 41,227, said to have come from Zuñi, in western New Mexico; 7½ inches in diameter.

3. A delightful old gathering basket, No. 42,126, from Oraibi. It is of the three-rod coiled variety, and might be taken for the original elegant Pomo Bamtsuwu. Each stitch

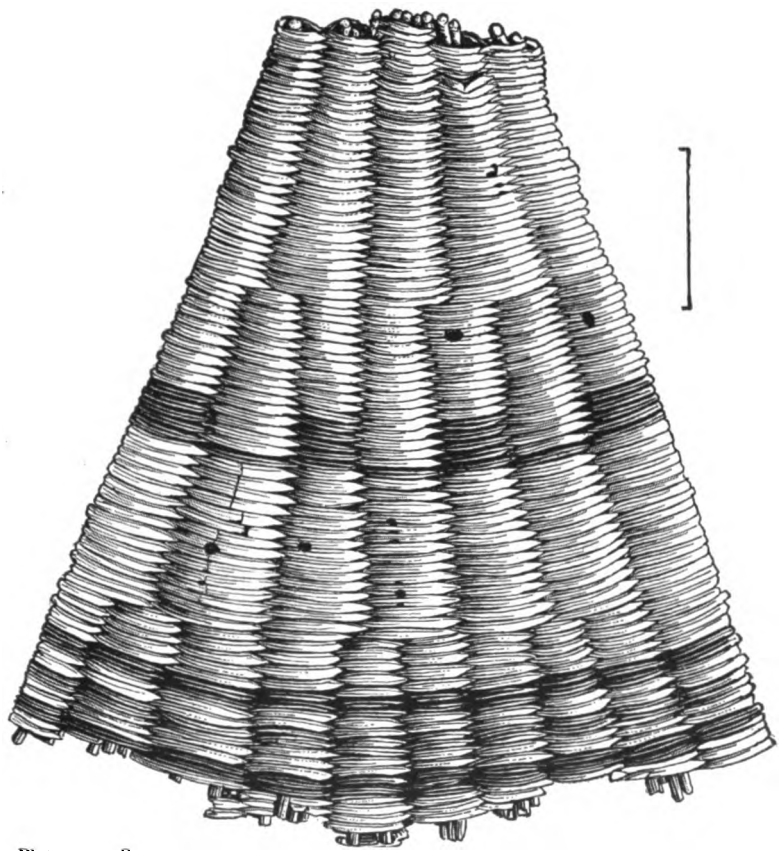


Plate 210. See page 450

FRAGMENT OF ANCIENT WICKER BASKET FROM CHEVLON PASS, ARIZONA. AFTER J. WALTER FEWKES

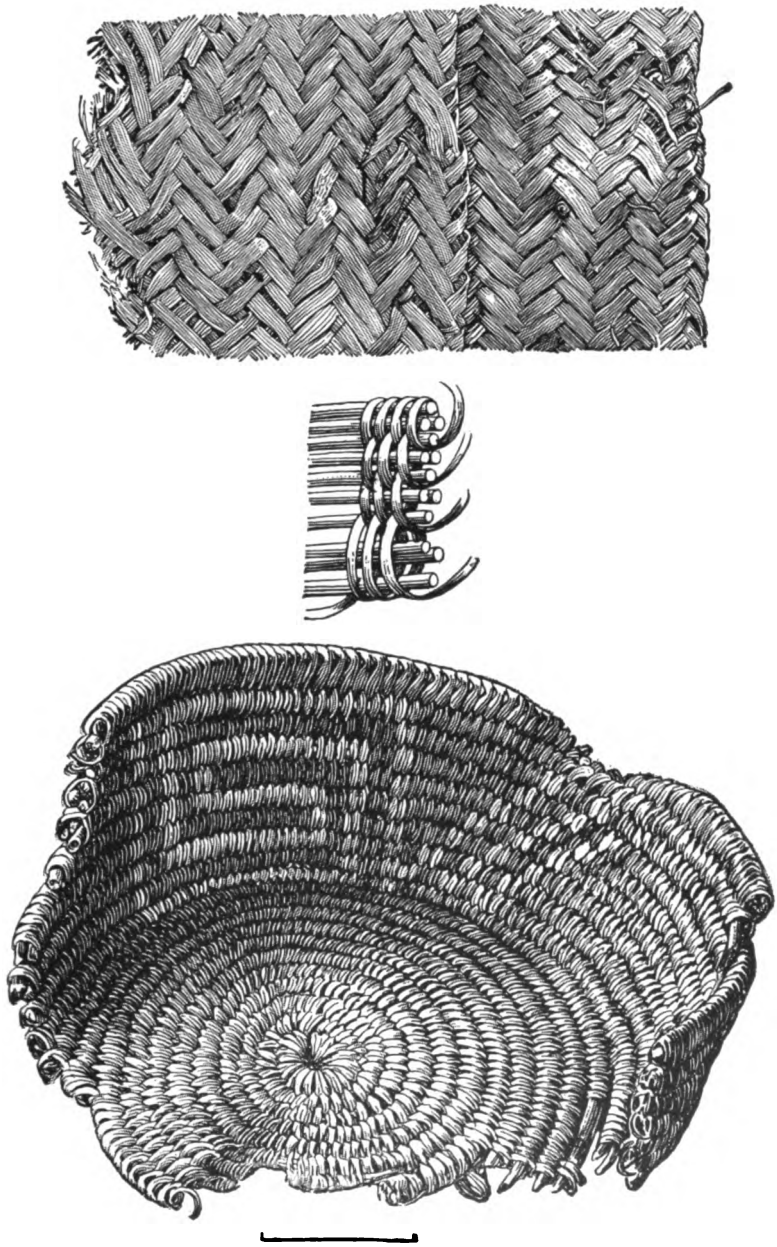


Plate 220. See page 459

FRAGMENTS OF TWILLED AND COILED BASKETRY, CHEVLON PASS, ARIZONA. AFTER J. WALTER FEWKES

passes over three rods of the current foundation and under the upper rod of the coil underneath, illustrated in fig. G on page 89. Its height is 7¼ inches.

4. A gathering basket in twilled twined technic. On the bottom is a projection whose function is not known. Notice on the shoulder three rows of twined work over two warps. The difference between this and twilled work is that the weft elements embrace the same pairs of warps and are superposed. The border is finished off with a neat herring-bone stitch. Catalogue No. 83,977, United States National Museum. Its height is 6 inches.

The old pieces on the lower row are equally interesting.

1. A globose coiled jar in three-rod foundation. The workmanship is coarse, but the form is suggestive of old pottery. This specimen is No. 84,596, United States National Museum, and is 7 inches in height.

2. A water jar in three-rod coil, modern, with lugs of horsehair on the side for carrying. The border is fastened off with a kind of sewing here called false braid. The material for making the vessel water-tight is pine resin. Catalogue No. 42,107, United States National Museum. Its height is 10 inches.

3. This interesting piece of water-tight twilled twined work is strengthened by an interior framework similar to that seen often in the large Zuñi packing baskets for donkeys, and suggests the possibility of transporting water in the same fashion. The weaving is rude, but all the better for holding pitch. The border, however, is neatly done in false braid. Catalogue No. 68,506, United States National Museum. Its height is 15 inches.

4. The water jar constricted in the middle might with propriety be called a canteen. Frequently the savages in this arid region tie a bandage around a young gourd, which afterwards takes the shape here shown. The foundation of the coil is more like that of Apache, the stitches interlocking. Indeed,

the piece is labelled "old Apache" by the collector. It is numbered 40,109 and is 8¼ inches high.

5. A water jar or pitcher in three-rod coil. It should be compared with No. 1 in the same row, secured in Oraibi by the same collector. It is Catalogue No. 84,596, United States National Museum. Its height is 8½ inches.

Fig. 191 is an ancient miniature gaming wheel, used frequently in the ceremonials of the modern Pueblo Indians.

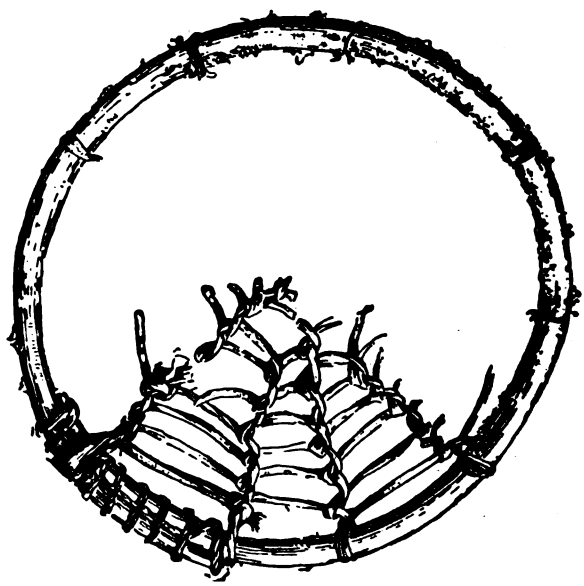


FIG. 191.
ANCIENT BASKETRY GAMING WHEEL.
Pueblo Indians, New Mexico.
Collected by James Stevenson.

Then, as now, the hoop of wood was made and a series of half-hitches passed around the inner side, done in yucca fiber. This process was repeated upon the loops thus constituted until the center of the wheel was reached. It is in effect a kind of coiled work in which the foundation is absent. Collected by James Stevenson.

Dr. J. Walter Fewkes was so fortunate as to recover from the Chevlon ruin, fifteen miles from Winslow, and in sight of

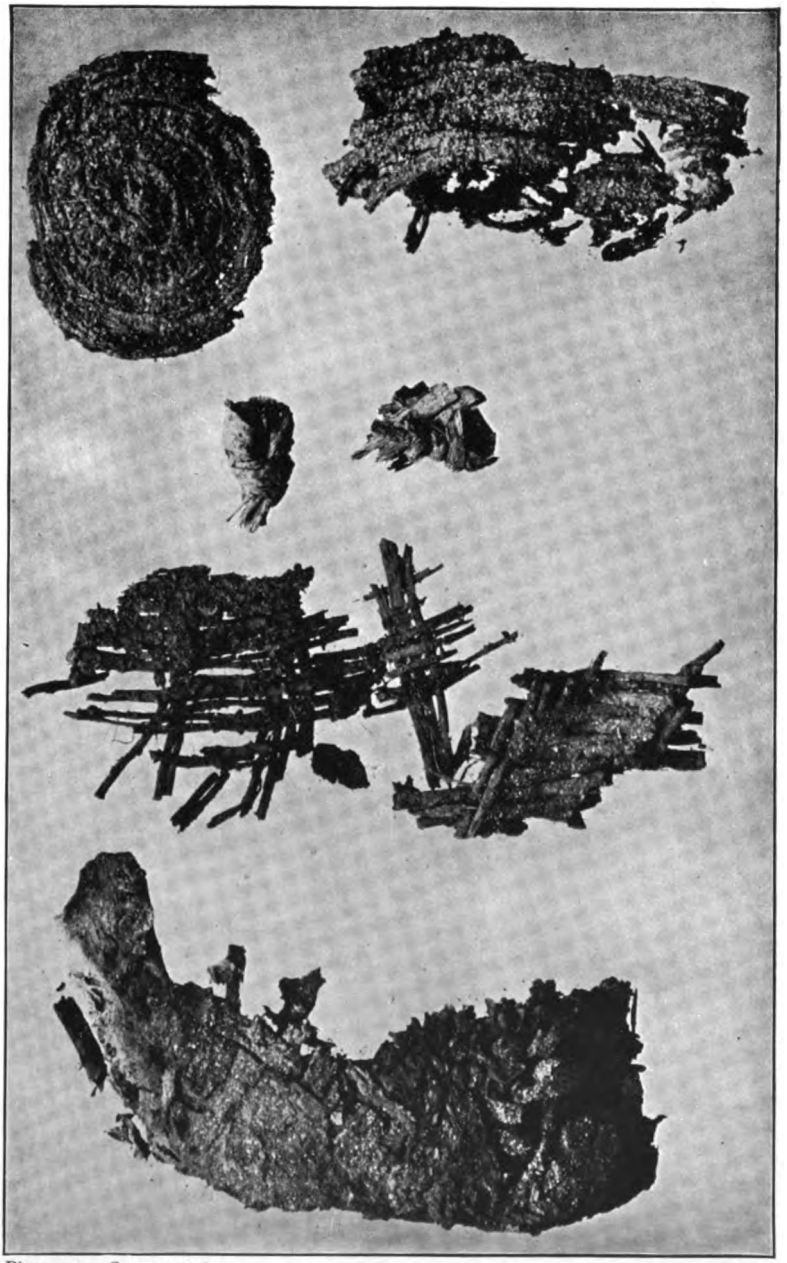


Plate 221. See page 460

ANCIENT WICKER AND COILED BASKETRY FROM RUINS IN ARIZONA
AFTER WALTER HOUGH

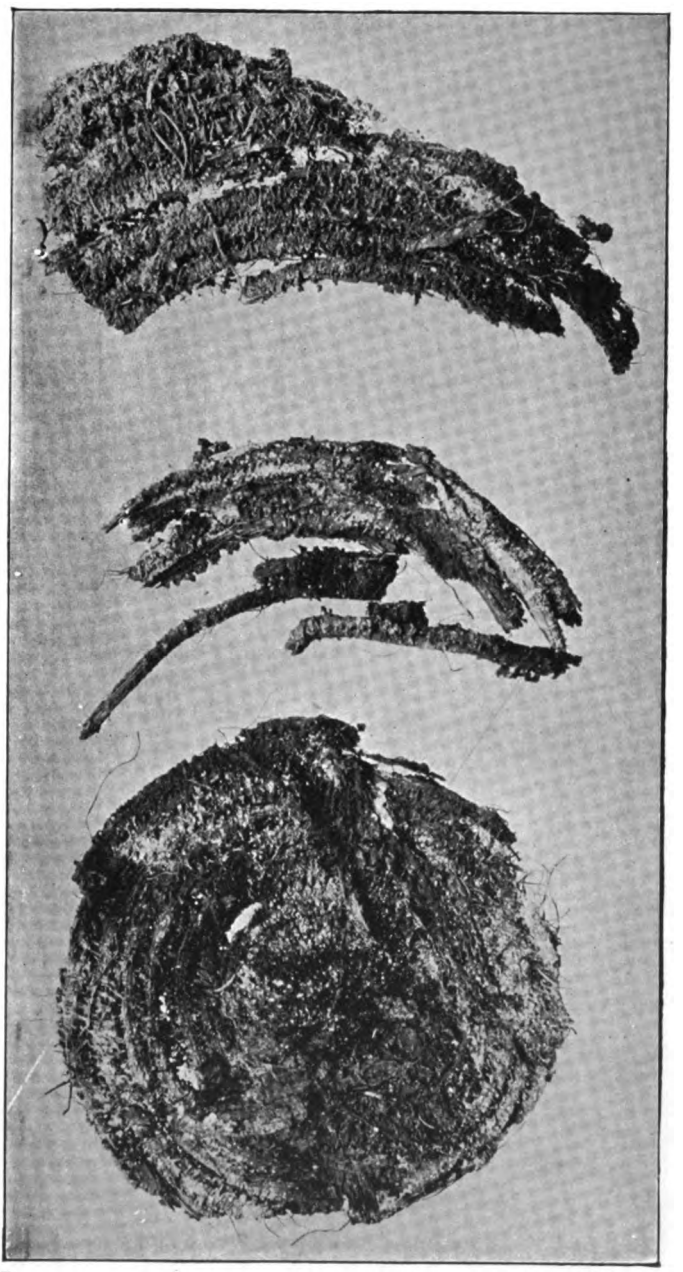


Plate 222. See page 460

ANCIENT COILED WARE FROM RUINS IN ARIZONA
AFTER WALTER HOUGH

the station Hardy on the Santa Fé Railroad, fragments of ancient basketry shown in the accompanying plates. The custom of burying baskets with the dead is still preserved in the Tusayan towns, and from the specimens here figured it has been inherited from ancient times. Baskets, says Fewkes, are not now made at the east mesa, and the craft is confined to the middle mesa and Oraibi.

The wicker baskets from several graves at Chevlon were identical with those made to-day in the pueblo of Oraibi. Some of these specimens were painted on the surface a green colour with malachite, or blue with azurite. In other examples, the small stems had been stained before they were woven. Plate 219 represents a segment from a wicker basket made from the stems of *Chrysothamnus graveolens*. The warp consists of small bundles of stems; the weft, of the same material barked and smoothed down, in some places dyed. The interesting feature of the specimen is the increasing of the number of warp elements as the basket enlarges. At first in the drawing there are five bundles of stems; about two inches lower the number is increased to seven; and near the bottom, by the introduction of new stems, ten warp elements are provided for. As in the modern basketry, in this ancient example the weft is soaked and woven in that condition and pressed home so effectually that the warp is invisible.

In Plate 220, fig. 1, is shown a specimen of ancient matting in twilled weaving. The work is done in split yucca leaves, just as to-day, and in certain places the figure shows where the leaf was stripped from the stalk. Examining the thousands of mats and soft baskets from the same pueblo reveals the identical method of doing the twilled work, but in a great many of the modern examples regular diaper patterns are introduced. In the same plate (fig. 3) is an ancient example of coiled basketry having foundation of three stems or rods. By referring to the California basketry it will be seen that this foundation is the same. This makes a very smooth surface, easily dis-

tinguishable from the rugose condition of Apache basket built on a single rod.*

These specimens are Catalogue Nos. 157,912, 157,915, 157,918 in the United States National Museum, and were procured at Chevlon, Arizona, by Dr. J. Walter Fewkes.

Plates 221, 222 illustrate the forms and uses of basketry in the pueblos of northeastern Arizona before the coming of the whites. The explorations of Dr. J. Walter Fewkes in Sikyatki and Awatobi, and the Museum-Gates expedition in 1901 to examine two ruins on the Jettyto Wash, a few miles from Keams Canyon, have brought to light wicker, twilled, and coiled basketry. The wickerwork is precisely identical with the little wicker trays or plaques made in the pueblo of Oraibi and used in religious ceremonies there. The twilled work is the matting of to-day, and the coiled resembles that of the Utes or Pimas rather than that of the Apache, having a foundation not of rods, but of fine material. The uses of basketry must have been in all respects as among the Hopis of our day, but Plate 223 shows the connection of such material with the care of the dead (Catalogue No. 213,074). The plate illustrates the fact that coarse wicker matting was placed in the bottom of the grave; on this was laid a matting of yucca fiber, and on this was deposited the body. In the dressing of the hair, then, as now, a plaited cord of human hair was employed. A description of its discovery appears in Dr. Hough's paper, Archeological Field Work in Northeastern Arizona.

Judging from the artifacts secured by the Museum-Gates expedition, these pueblos belong to the type of Awatobi and Sikyatki, and, as far as appearances go, may have been contemporaneous. Dr. Fewkes regards Sikyatki as one of the most ancient pueblos of the Hopi group. It is well known that Awatobi was inhabited up to the year 1700, but there is no historical reference to the pueblos from which these specimens were derived, and there is no evidence of the Iron Age in them.

* Smithsonian Report, 1896, pls. XXXII and XXXIII, after Fewkes.

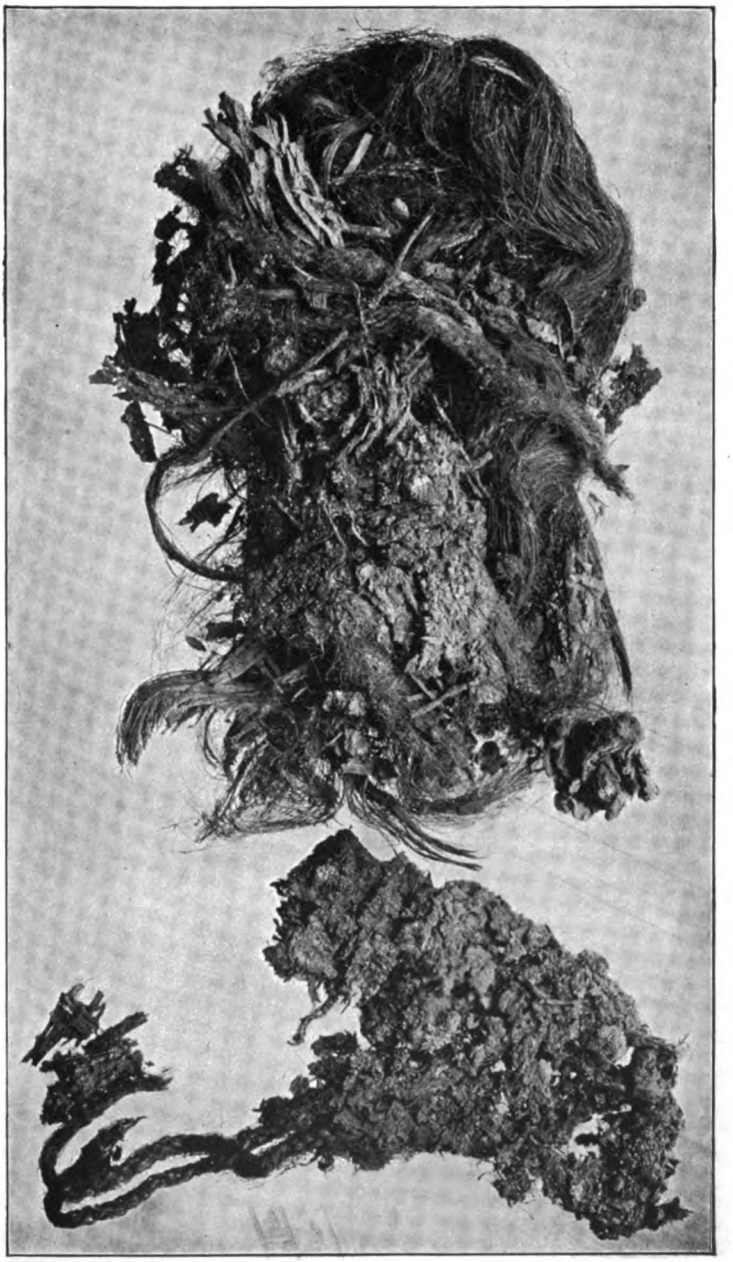


Plate 223. See page 460

ANCIENT COILED AND BRAIDED WARE, IN MORTUARY USES, ARIZONA. AFTER WALTER HOUGH

It seems probable, however, that they date before the year 1700, but just how much anterior it is not possible at present to say.*

Athapascan Basketry

A summary of Athapascan basketry in its ethnic areas would indicate the following:

The northern Athapascans in the interior of Alaska and in the Mackenzie drainage make coiled basketry in a variety of types, the material being willow and root of the conifers. The Pacific coast group, living formerly in Washington, Oregon, and northwestern California, near the sea, of which the Hupas are the best known, excel in twined work with decoration in overlaying, but these tribes have not the versatility of the Pomo, farther south. All the weaving is of one variety, well known in the region.

The southern Athapascans, under many names, practice both coiled and twined basketry. They base their coiled work on hard stems, and sew them with splints of cottonwood, mulberry, sumac, and willow, or strips of yucca. They also used agave fiber.

The mescal plant (*Agave americana*), says Bourke, is to the Apache what the palm is to the East. It is baked in ovens for victuals, and its juice is fermented to make a drink. For the basketmaker the thorns are good needles, the fibers excellent thread material, and the flower stalk forms the frame of the carrying outfit.

The Apaches or southern Athapascan basketmakers were formerly spread over eastern Arizona, western New Mexico, and in Texas along the Rio Grande, as will be seen in Powell's linguistic map.† They were gathered on reservations by

* Archeological Field Work in Northeastern Arizona. The Museum-Gates expedition of 1901. Walter Hough, Report of the United States National Museum, 1901, pp. 279–358.

† Seventh Annual Report of the Bureau of Ethnology, 1891, pocket.

General Nelson A. Miles. Scattered bands are to be found here and there. Mr. James mentions one near Short Horn Mountains and in the neighbourhood of Palomas and Agua Caliente, comprising about thirty families of basketmakers. The collector or student must not be surprised, therefore, if in the hands of Apaches is seen work of other tribes. Indeed, he will frequently see the women borrowing materials, structures, forms, and even designs from outside. A large and varied collection of Apache ware is exhibited in the Free Museum, of Phoenix, Arizona, collected by Messrs. Benham.

On the authority of Mrs. J. S. Newman there are five tribes on the Apache Reservation, and a few scattered members of other tribes, but five only are basketmakers. Of these, the Tonto should rank first, making chiefly ollas, which require more skill than plaques or bowl shapes, and their work is invariably even and good. Their specimens are nearly always marked with the arrow-point, the pattern running vertically from the center. Their proficiency is accounted for in the fact that the land allowed them on the Gila River is the least productive of any on the reservation, hence their dependence on basket-making for a living.

The center or beginning of either Apache coiled bowl or olla is always wrapped with black (devil claw), and the rim finished with the same stitch as that used throughout the body of the work, both or either colours being used.

Plate 224 shows a number of Apache coiled bowls belonging to the collection of J. W. Benham. The foundation is in whole stem and the sewing done with splints of white wood and martynia. A comparison of these ten pieces reveals tolerably well the genius of Apache decorations. There are discrete figures of men and beasts; also both radial and concentric designs; and in the crenelated (fig. 10) and fretted motives (figs. 5 and 9) suggestions arise which point to the Tulare area. The Apache, naturally a wanderer, has picked up here a little and there a little of design.

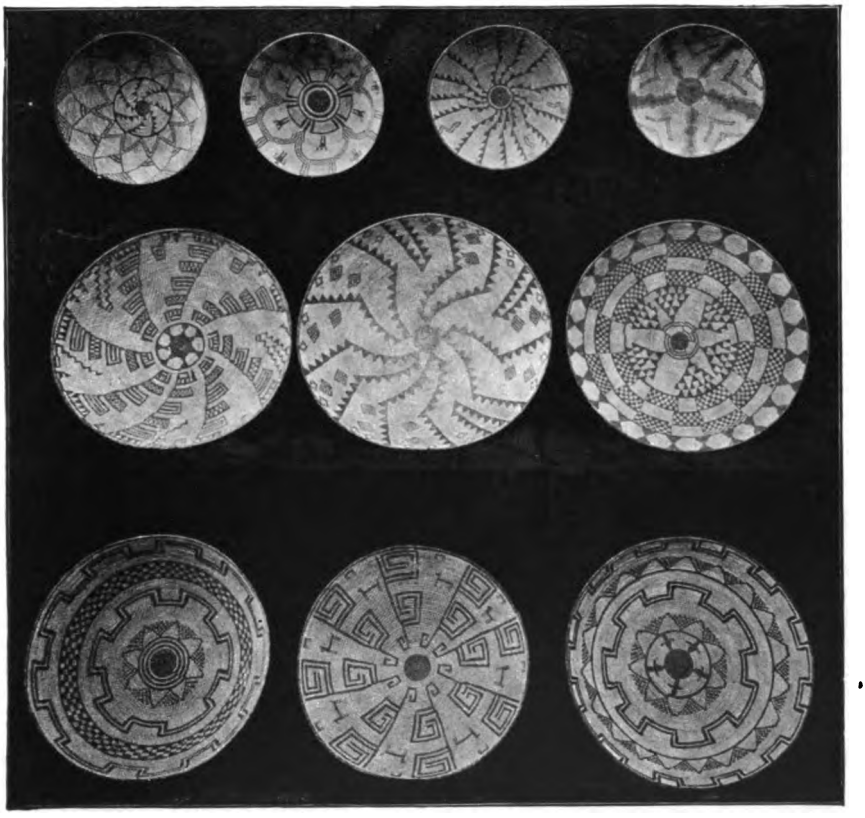


Plate 224. See page 462 COILED BASKETRY OF THE APACHE, SHOWING BORROWED DESIGNS, ARIZONA

1 2 3 4
5 6 7
8 9 10

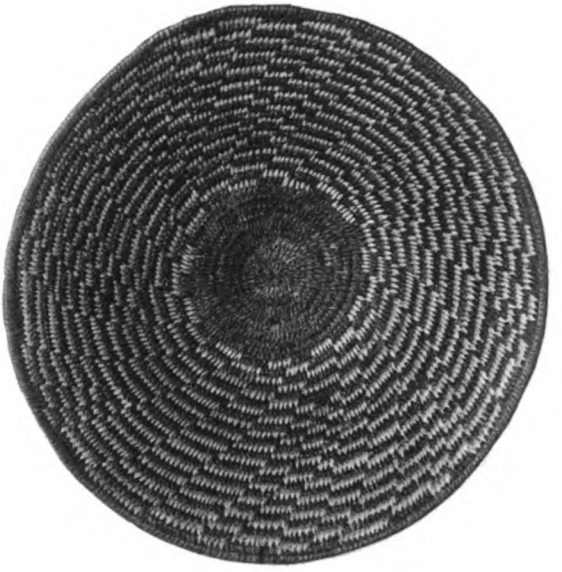
Collection of J. W. Benham

Plate 225. See page 463

APACHE COILED BOWLS

The design of the upper bowl represents the sunflower; the lower bowl is a modern design of excellent conception, but inaccurately worked out in one place

Collected by Walter Hough



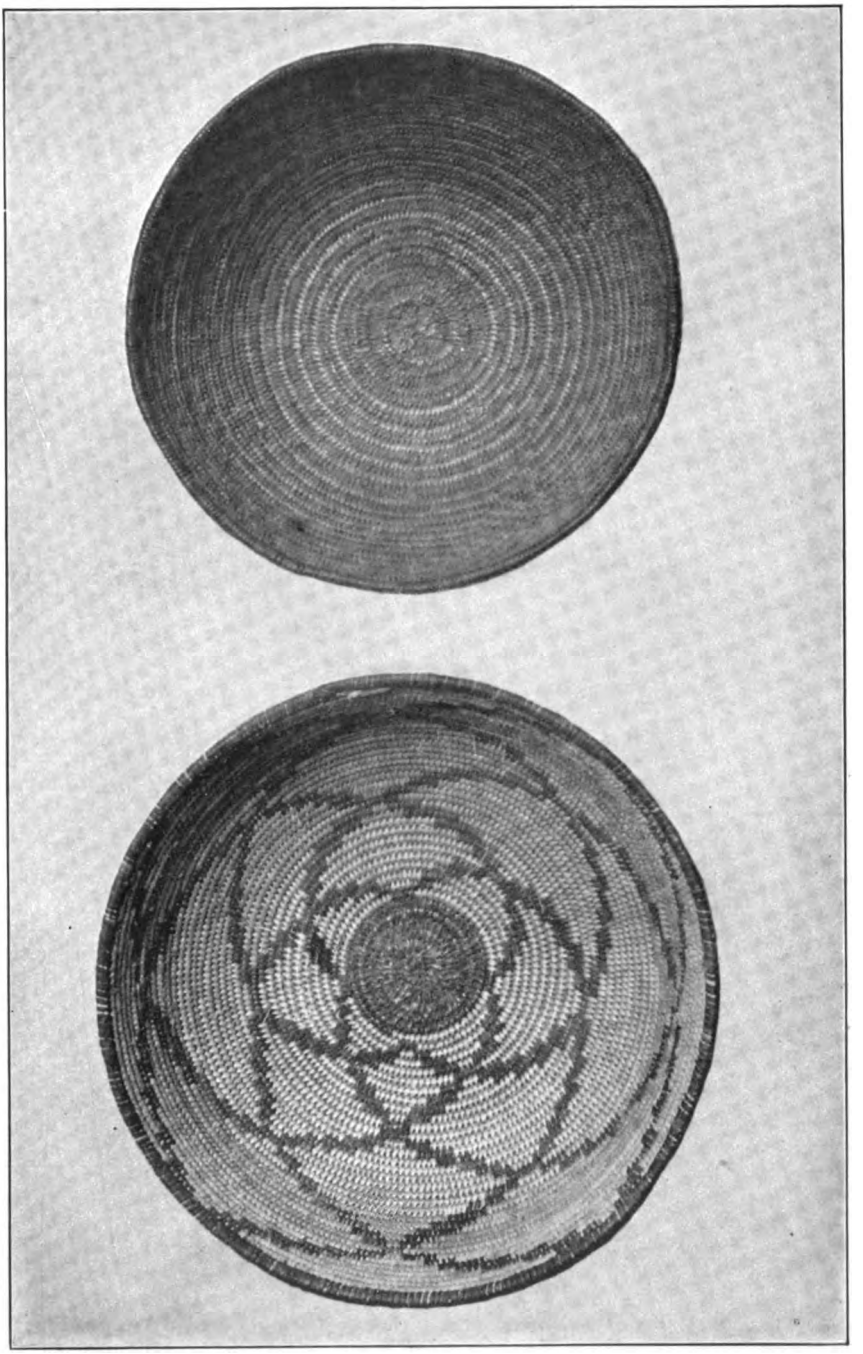


Plate 226. See page 463

COILED BOWLS OF THE WHITE MOUNTAIN APACHE, ARIZONA

Collections of U. S. National Museum

The White Mountain Apaches are clustered around Camp Apache, the agency, and on two of the large creeks running south from the Mogollon mesa. The art of basket-making is not actively practised at present, the younger members of the tribe finding it difficult to learn, and saying that it injures their hands. Some of the old women, however, retain the ancient skill, and even superior work may be secured from the reservation. It may be said that the carrying baskets and the pitched water bottles are as frequently made as ever and are in constant use, whereas the finer bowls, which were formerly common, as among the Pueblo tribes, for storing meal, etc., are growing rarer every year and command high prices.

The baskets shown in Plate 225, Catalogue Nos. 213,262 and 213,268, United States National Museum, were secured at the agency in the summer of 1901.

Fig. 1 is a small, well-woven bowl, the design representing the sunflower.

The second figure is a modern basket with geometrical pattern, which in certain portions is quite inaccurately worked out. On the whole, the design is excellent.

Plate 226 represents coiled basket bowls of the White Mountain Apache. The foundation of the upper figure is of willow, the sewing in splints of white wood and martynia in alternate rows, which are divided into four sections by V-shaped ornaments, effected by changing the direction of the lines in black.

The lower figure is the same material, foundation of rods, sewing in white and black, coarsely done, stitches scarcely touching. The whole surface is covered with rhomboidal figures, produced by crossing of four sets of lines in pairs, passing in cycloidal curves from the bottom to the margin. Catalogue Nos. 213,264 and 213,265.

The specimens were collected by Doctor Walter Hough, on White Mountain Apache Reservation, 100 miles south of Holbrook, Arizona.

The symbol is that of the martynia hooks, the sharp points having been allowed to project from the inner surface in certain areas.

The shoots for basket material are gathered in the spring, tied in bundles, and put away in the houses for future use, sometimes with the bark on, at others without. When the basketmaker is ready, the osiers are soaked thoroughly in water; the stems are employed whole for the foundation of the coil, and the sewing is done only with the outer layer, the inner portions being peeled off and the splints scraped. One end is held in the mouth, the other in the left hand, while the steel knife, formerly the stone knife, is used in the right hand.

FIG. 192.
COILED BOWL.
Coyotero Indians, Arizona.
Collected by H. W. Read.

The ornamentation on all this basketry is in *Martynia louisiana*, or devil horns (Tagate), the design itself often being the figure of the plant. The awl used in the sewing is called by the White Mountain Indian, tsatl; the coiled bowl, tsa; the spindle-shaped water jar, tose; the carrying basket of twined work, ta tsa; the gathering scoop, pen al té; and the shoots of wood, tsin.

Fig. 192 shows the ornamentation on a coiled basket bowl of the Coyotero, on the San Carlos Agency, in southern Arizona. The parts are in three; the smaller design is made up

of a combination of little squares and triangles, the larger design being more complicated in its elements, with its three vase-shaped parts, which terminate in the dark circle of the center. The meaning of this design is unknown.

This specimen, Catalogue No. 4,428 in the United States

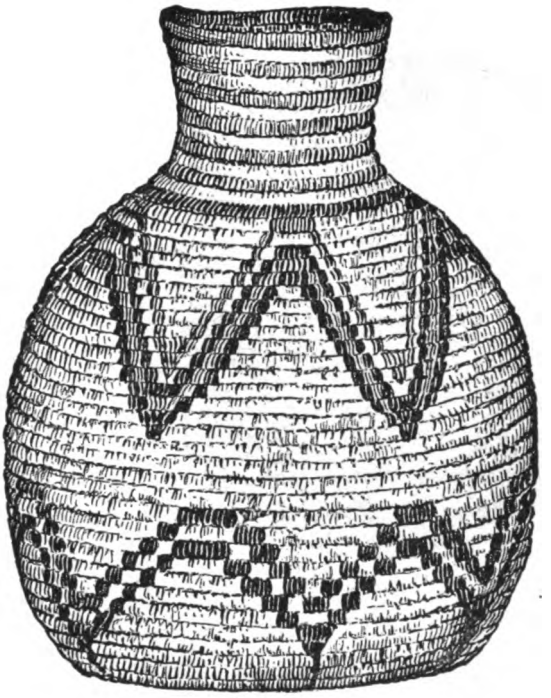


FIG. 193.
BASKET JAR.
Apache Indians.
Collected by J. B. White.

National Museum, was collected on the Gila River, Arizona, by H. W. Read.

Fig. 193 is an old bottle-shaped coiled basket, made, according to Dr. Hough, long ago by the Mescalero Apache, before they adopted the present wide variety. The foundation of the coil consists of a rigid stem overlaid with soft fiber. The stitching passes over the foundation of the coil, under the packing of the coil underneath. The sewing is done with

splints of willow or cottonwood. The ornamentation consists of six rows of coiling in brown material on the neck, a row of black material on the shoulder, with two rows of chevrons on the body. The latest Apache has only black and white in decoration; red and brown are old and rare.

This specimen, Catalogue No. 21,494 in the United States National Museum, was collected in Arizona by Dr. J. B. White, United States Army.

FIG. 194.
COILED BASKET BOWL.
Apache Indians.
Collected by J. B. White.

Fig. 194 is a design on a coiled basket bowl of the Apache. The foundation of the bowl is the rod-and-splint pattern, and the sewing passes over it, under the splints of the coil below, the stitches interlocking. The design is in *Martynia louisiana*. The apparently unsystematic ornamentation is, in fact, perfectly regular. Four lines of black stitching, of the same lengths in each of four groups, proceed from a black ring around the center. From the ends of these lines the sewing is to the ieft in regular curves. The four radiating lines are repeated, and then the curved lines until the border is reached. The suggestion of lightning or the limbs of some insect has been made, but the design has not been explained by any basketmaker.

This specimen, Catalogue No. 21,493 in the United States National Museum, was collected in Arizona by Dr. J. B. White, United States Army.

Plate 227. See page 407

MESOAMERO COILED BASKETS

Shows a surprising adaptation of the shades of the motor to form an artistic design, seen in the upper figure. The lower figure is a convolution, decorative which also shows an effective tone of materials.

Collected by Walter Hough

Plate 227 represents a jar and a plaque by the Mescalero Apache Indians of New Mexico, collected by Dr. Walter Hough, Catalogue Nos. 204,651 and 204,646 in the United States National Museum. Especial attention is directed to the width of the coils in these baskets. It will be remembered

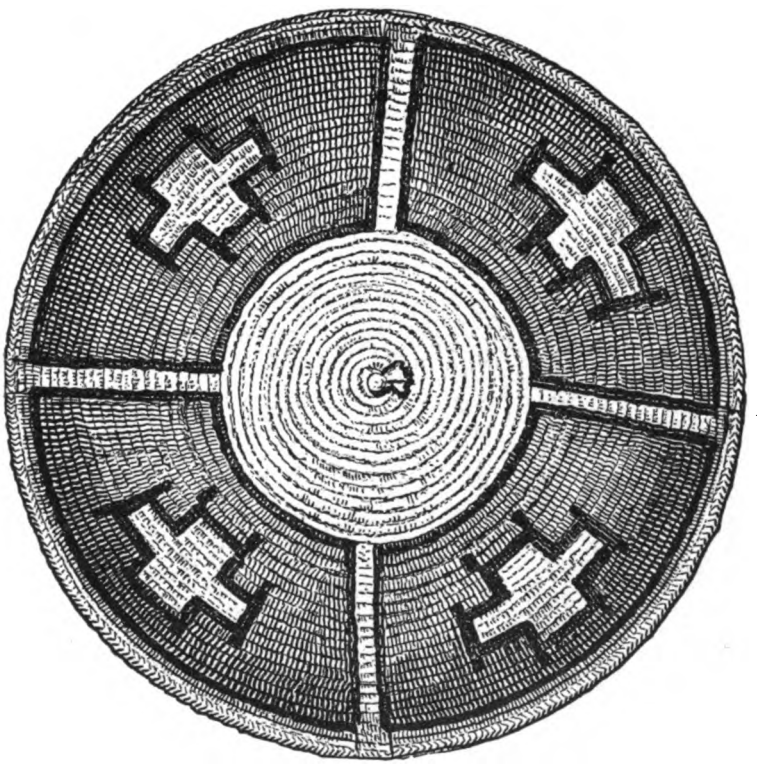


FIG. 195.
COILED PLAQUE.
Navaho Indians.

that the Fraser River tribes in British Columbia obtained an economical result of widening coils by the introduction of narrow strips of wood instead of roots or bundles of grass for the foundation. These Apache Indians have also discovered that using two or more rods, one lying on the top of the other, will give the same result. The stitches in yucca also, instead of passing underneath a rod in the coil below, are simply inter-

locked with the stitches underneath. The ornamentation is produced by different colours of the same substance. The outside of the leaf is green in different shades, but the inside of the split leaf is white. By exposing the inside or the outside the angular ornamentation results. In such wide foundation

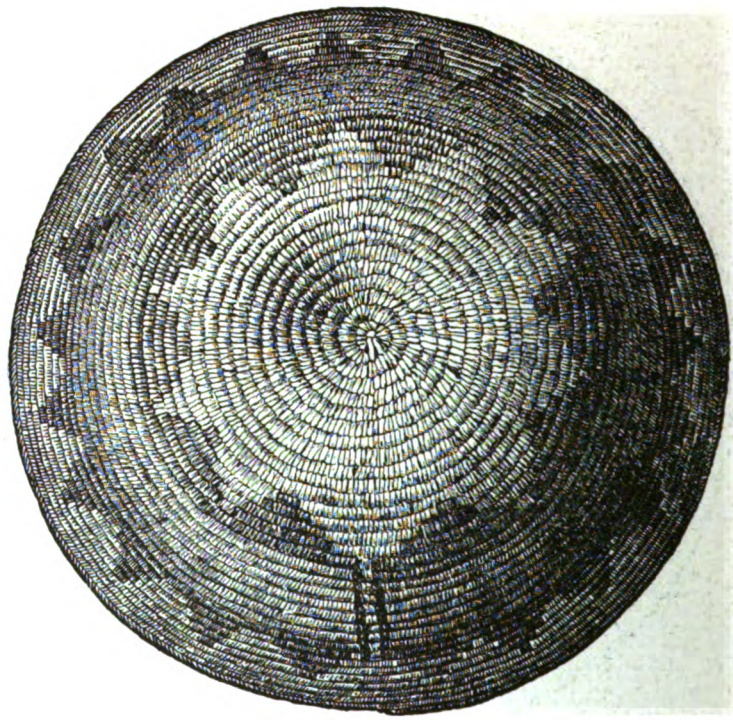


FIG. 196.
SACRED BASKET TRAY.
Navaho Indians.
Collected by Governor Arny.

the designs must be very simple. The dark lines in the lower figure are produced by using the small roots of the same plant in sewing. This fiber is very much more brittle than the leaf. Comparing these two examples with the plaques of the Hopi Indians demonstrates better than any other figures yet employed the limitations of the basketmaker in the very elements of ornamentation. Each separate part of the mosaic

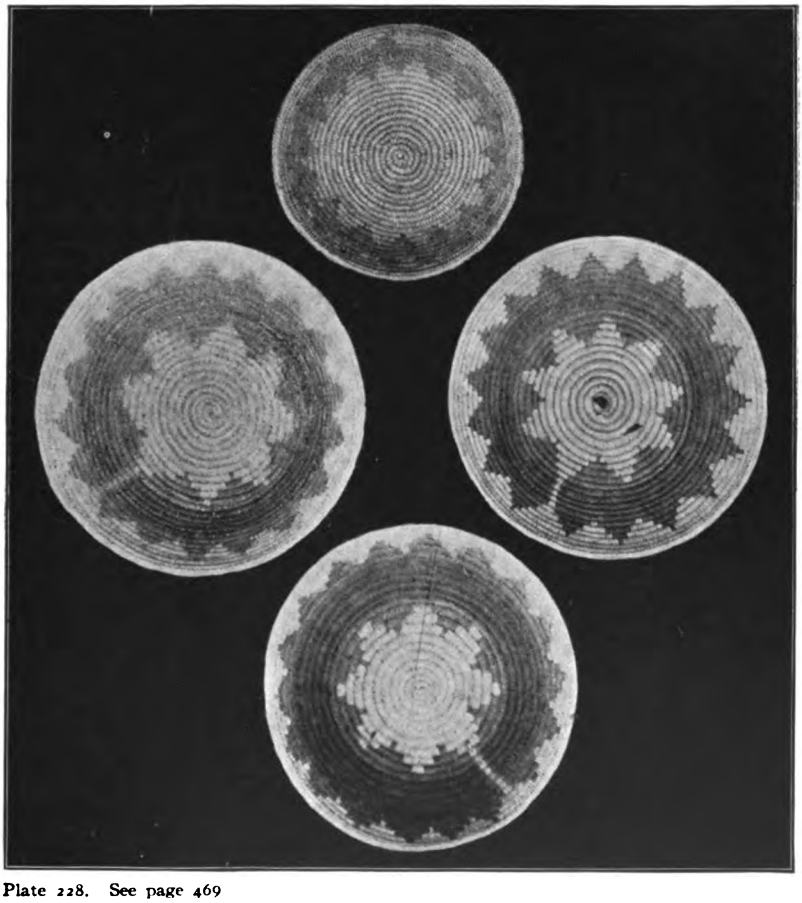


Plate 228. See page 469

CEREMONIAL BASKETS OF THE NAVAHO, ARIZONA

Photograph from Mrs. I. H. Kirkpatrick

is a long stitch, set vertically in the jar and radially on the plaque or bowl. From this the basketmaker can not escape.

Fig. 195 is labelled a coiled plaque of the Navaho. In this example the foundation is a single rod. The body colour of the bowl is that of the wood. The ornamentation is in splints of rhus dyed mahogany brown and black, and consists of four quadrants, in each of which is a cross-shaped figure. The boundary of the space is black, filled in with brown. The figure is in the colour of the wood and has a black border. In the sewing, the stitches simply interlock with those underneath. The border of the specimen is worthy of study, being what is called elsewhere false braid. The Apaches, on the contrary, make borders in plain coil. Catalogue No. 16,510 in the United States National Museum was collected in 1873 by Governor Arny, of New Mexico.

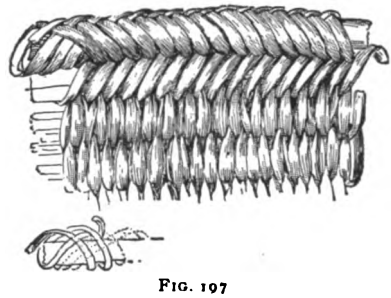


FIG. 197
BORDER OF FIG 196.

Plate 228 is a collection of Navaho sacred basket drums belonging to C. P. Wilcomb. Baskets attributed to the Navaho are extremly uniform in every respect. On the authority of Dr. Washington Matthews, the sewing-material is splints of sumac (*Rhus aromatica*). Some Indians told Dr. Hough that a species of willow growing along the washes is sometimes used. The stitches in the sewing simply interlock, and there is no attempt made to pass into the foundation of the coil underneath. The borders are in false braid passing by a figure "8" movement under the foundation and over the outer margin. In the ancient days a Navaho woman invented this pretty border. She was seated under a juniper tree finishing her work in the old, plain way, when the god Hastseyath threw a small spray of juniper into her basket. Happy

thought! She imitated the fold of the leaves on the border and the invention was complete (Matthews).

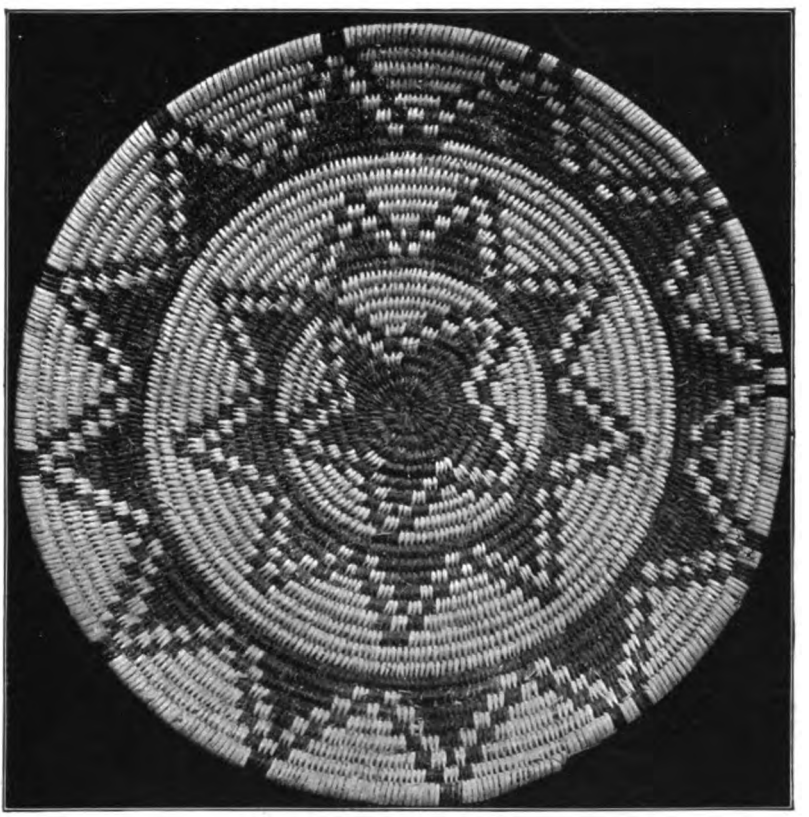
The decoration also of the Navaho baskets is in designs taking the form of bands for their sacred drums (fig. 196) and of crosses (fig. 195) for their sacred meal baskets. The coloured bands on the drums are founded on a central stripe which may be light or dark, and from the borders project variously notched or angular figures. The one characteristic to which attention is always directed in this ware is the break in the band. It is mentioned elsewhere on the authority of Matthews that a line drawn from the center of the basket through this open pathway will end at the point where the basket was finished off, and when it is used as a drum this is the point where the hand of the medicine man must be placed in the plaque, the radial line pointing eastward. Another interpretation of this, which can not here be proven, is that this break in the ornamentation has something to do with the passing backward and forward of the spirit of the basket, as in the Pueblo pottery decoration.* (See figs. 196 and 197.)

Dr. Ales Hrdlicka writes that the Hualapai and Havasupai, although associated with the Yuman family linguistically, are decidedly one with the Apaches in physical characteristics.

Their basketry, therefore, will have to be compared to that of the Apaches, and not that of the Mission Indians of southern California, who are Yuman. The foundation is a solid stem with a welt. The sewing is done with splints of willow, and also now with those made from the young and tender suckers from the cottonwood tree, from 2 to 3 feet in length.

The Hualapai baskets are made in white or green fiber and ornamented with two kinds of red or with black fibers. Dyes are very rarely used. The green fiber is from a bush called Ke-the-é, growing in the mountains; the brownish-red

* See Washington Matthews, The Night Chant, a Navaho Ceremony. Memoirs of the American Museum of Natural History, VI, pp. 1–332, New York, 1902.



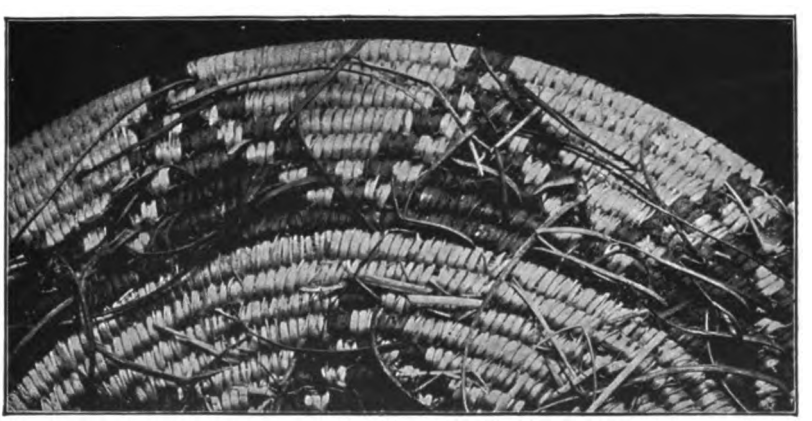


Plate 220. See page 471

COILED BASKET OF THE KOHONINO, ARIZONA, SHOWING METHOD OF FINISHING OFF

Collection of A. Hrdlicka

Plate 230. See page 471

HAVASUPAI COILED BOWLS

Old Havasupai basketwork was bartered with the Hopi, who valued them as heirlooms, though often they may be found in use around the mealing troughs, or filled high with meal and placed on a shelf.

Collected by Walter Hough

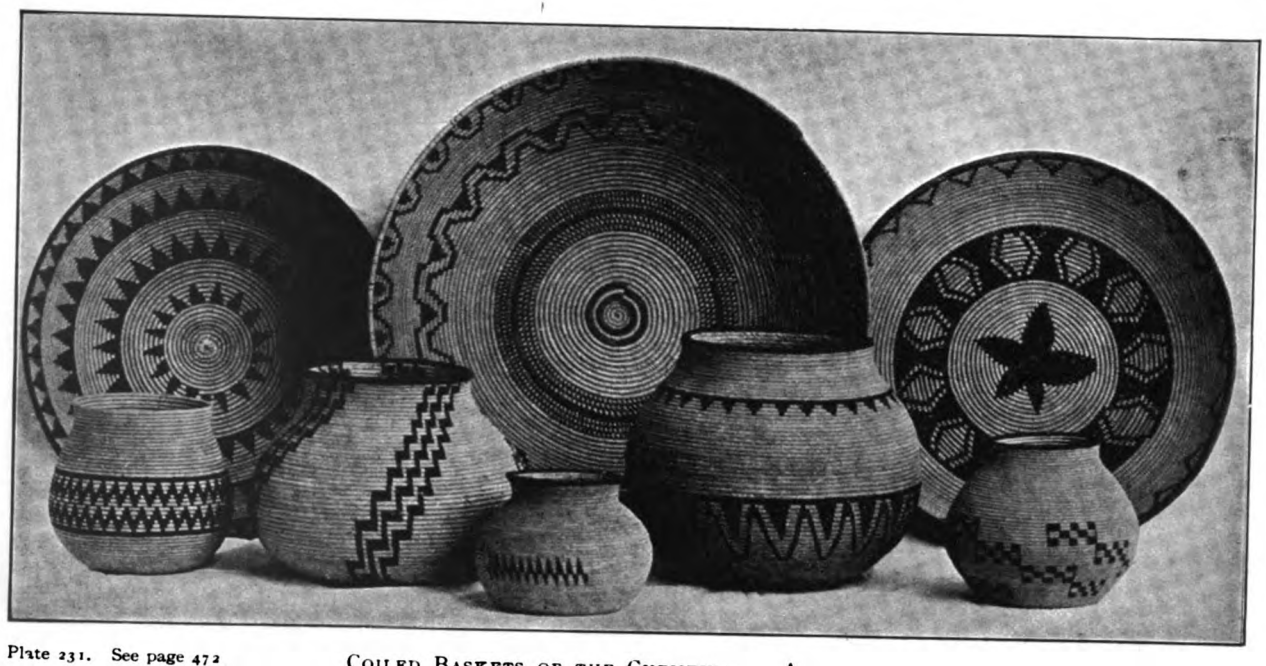


Plate 231. See page 472

COILED BASKETS OF THE CHEMEHUEVI, ARIZONA

Collections of U. S. National Museum

fibers are roots (Mi-s'-ma) of a yucca-like plant called M'-nat; the black fiber is from the martynia. A brighter red fiber is from the root of the Ma-k'-tu-na, a small plant growing in the mountains. The white ribs and splints are from reeds known as Ke-he-é, or K'-he-e-he-vak, the former also occasionally from reeds called Ma-tha-ki.

The Hualapai make five varieties of baskets. They are:

1. A shallow, undecorated plaque, for general household purposes. It also serves for parching seeds. It is nearly always lined with pitch on the inside, which protects it from charcoal.

2. A large cone-shaped carrying basket, called Ka-thak. This variety is almost always decorated with narrow bands or isolated geometric figures in black or brown. The weaving is better than on No. 1, but is not water-tight.

3. The third variety, both for household use and in better style, with more decoration, made for sale, is flat-bottomed, with globular or cylindrical body, slightly narrowing in its upper third, and in some places flaring a little at the border.

4. The fourth variety is the water bottles, of various shapes, most often globose in body and tapering into a narrow neck. Covered inside and outside with brownish pitch.

5. A much better made and more profusely decorated variety is in the form of a small, shallow plaque.

Plate 229 represents a Kohonino (Yuman) coiled basket. While the coiling is going on, the ends of the splints are left projecting. They are trimmed off all at once, when the sewing is finished.

Plate 230, fig. 2, represents a Havasupai coiled basket bowl. The foundation is of rods and splints of willow, and the sewing is the same. The most interesting feature is the border. It is false braid in which two rows of the coil are involved. A single splint passes down and includes both foundations, up, over, and under the upper foundation only, then back and under both to the point of beginning. This is an

old specimen that had been in the possession of a family for many years. From the Sichomovi (Hopi) Pueblo, made by the Havasupai (Yuman) Indians, collected by Dr. Walter Hough.

The Apache-Yuma basketmakers at Palomas, Arizona, sit in front of their brush and straw shelters the same as the Pimas, hold the right side of the plaque or bowl inward, and work their sewing toward the left hand. (G. C. Simms, Field Columbian Museum.)

The Mohave Indians (Yuman family) do not make baskets, but obtain them from other tribes, and examples will be found in every house. They obtain their rabbit-skin robes, done in twined weaving, from Paiutes (Shoshonean family) and Walapai (Yuman family). The Mohaves make constant use of the wrapped weaving. (See page 67 and Plate 17.)

The Chemehuevi are Shoshonean linguistically, and are now located on the Colorado River Agency, Arizona. They make coiled baskets. The foundation is a rod, and the sewing is done with willow or other splints, maybe cottonwood. The black figures are from the pods of martynia. Only two colours are used; frequently, however, feathers are introduced under the stitches. They are the most tastefully made and the most beautiful baskets in that whole region. Catalogue No. 211,028 is a Chemehuevi plaque in the National Museum, collected by Captain Paul B. Carter, U.S.A. The ornamentation consists of a black center and two bands done in martynia pod. The surface is covered with a network of rhombs. Plate 231 is a collection of Chemehuevi plaques and jars in coiled weaving now in the United States National Museum. Especial attention is called to the purely geometric figures on the surface, star, toothed lines, rhombs in bands, crenelated and serrated lines in great variety. In the central figure the middle band recalls the design, a modification of which becomes the well-known flying butterfly pattern. (See Plate 195.)

The tribes of the Piman family are in two groups, the

Plate 232. See page 473

PIMA INDIAN CARRYING FRAME

Collected by Frank Russell

northern, including Opata, Papago, and Pima proper; and the southern, including Cahita, Cora, Tarahumara, and Tepehuana, wholly confined to Mexico. By many scholars the Piman family would be made part of the great Uto-Aztecan.

The Piman basketry is unmistakable. The foundation is of split cattail stems (*Typha latifolia*), and the sewing is with willow (*Salix nigra*) and pods of martynia, but the stitches are so fine and the work so uniform that the surface is not rugose, but smooth. The Pima decoration is the exuberance of fretwork. In the National Museum are many old pieces brought home by Army officers. Edward Palmer also collected many, and recently Dr. Frank Russell has enriched the collections with material which will be the subject of a special monograph. Coiled work without foundation finds application among the Pima in the network which supports their gourd receptacles. (See fig. 198.)

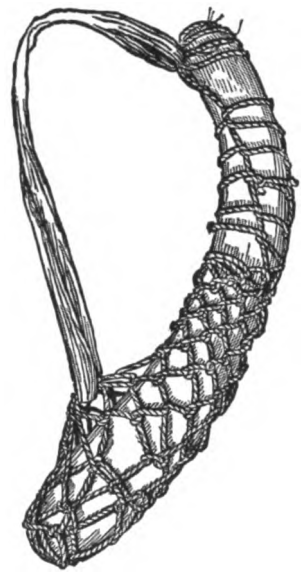


FIG. 198.
GOURD IN COILED NETWORK.
Pima Indians, Arizona.
Cat. No. 76,947, U.S.N.M.
Collected by Edward Palmer.

It has been said that basket-making was introduced among the Pima 100 years ago, when the Maricopa sought shelter among them from the slaughter of the Yuma. At that time the Pima made pottery only. On the other hand, the Maricopa allowed basket-making to fall into disuse, and now make pottery only. The Mohave, Pima, and Papago make matting in twilled work, and also carrying frames covered with rude coiled lace. (See Plate 232.) A beautiful example of the last named is in the National Museum, collected for the Bureau of American Ethnology by Frank Russell.

They had no pails or vessels of wood, but were not slow to invent. They, therefore, took willows, which grow in abundance along the river, and a reed, and stripped the bark, then very adroitly split these with their teeth and wove them so closely together as to hold water. This they accomplished by means of needles or thorns of cactus, of which there are over one hundred varieties in this territory. They used these baskets while digging small ditches, the women filling them with earth and carrying them up the bank.*

Catalogue No. 76,033, United States National Museum (see fig. 100), is a carrying basket (child's) of the Pima Indians, a pyramidal bag netted of the fiber of the agave; at the vertex is an opening 3 inches in diameter. The base is attached to a hoop by a string of agave fiber, with which the hoop is served; the bag is decorated with fretted work painted black and red. Two stems of the *Cereus giganteus*, 34½ inches long and ½ inch in diameter, are passed from the outside of the hoop to the inside of the bag, 10 inches apart, thence down till they pass through the opening in the vertex; at this point they cross each other at an acute angle and extend 7½ inches beyond; two other stems, 14 inches long, are passed into the bag, in front, in the same way, 9 inches apart, and their ends stop at the crossing of the other sticks; at this point the four are firmly lashed together and the margin of the bag at the vertex opening is fastened to the sticks.

Where the sticks enter the bag the hoop is tied to them by a cord of black horsehair; these also serve to tie the load in the basket. Near the bottom, a small brace of wood is passed through the meshes of the bag and in front of the sticks on either side, to give it additional strength. A piece of matting of split reeds, 16 by 7 inches, is attached to the back of the basket to protect the body of the carrier.

A strong cord of twisted agave fiber, 3 feet long, is looped around the vertex; the ends passed along the posterior sticks, outside the bag, are fastened to the sticks by a loop of fiber.

* Isaac T. Whittemore, Among the Pimas, p. 53, Albany, N. Y., 1893.

Above, the ends are attached to the forehead band, woven from the softened fiber of the *Yucca baccata;* it is double, and 7 inches long and 2 inches wide. The staff is of wood 21 inches long and ½ inch in diameter, painted red, ornamented at upper end with buckskin strings, and served with agave twine; the upper end is notched. The staff is also used to support the basket in an upright position when it is unslung. (See figs. 100 and 106.) Width above, transverse, 13 inches; antero-posterior, 11 inches; depth behind, 11½ inches; front, 7¼ inches. Collected by Edward Palmer. This peculiar lacework exists also among Maricopas, Papagos, and Coras.

FIG. 199.
COILED BOWL.
Pima Indians.
Collected by Edward Palmer.

Fig. 199 is a coiled bowl of the Pimas. The foundation is made of grass stems or cattail, and the sewing is done with narrow and uniform splints of cottonwood or willow, the black figures being worked in with martynia. The puzzling and intricate ornamentation is reducible to a few most simple elements, and easy of construction. Four series of vertical lines start from the black bottom. At uniform distances from the beginning, all the way out to the rim, horizontal lines proceed to the left, terminating in small black squares. It can easily be seen that, while the vertical lines are narrow and depend upon the width of the stitches, the horizontal lines must necessarily be as wide as the rows of sewing. About two-thirds of the way from the beginning a new set of zigzags is started, and this is continued to the outer margin.

This specimen, Catalogue No. 9,376 in the United States

National Museum, was procured in Arizona by Edward Palmer, and is figured by Holmes.*

Fig. 200 is a coiled basket bowl of the Pima Indians. The foundation is of shredded material and the sewing is in splints of willow. The decoration is in three series, as follows: Bot-

FIG. 200.
COILED BOWL.
Pima Indians.
Collected by Edward Palmer.

tom, solid black; the main portion of the body is a double row of fretwork in single lines of black; on the upper margin is a single row of fretwork. The up-and-down-lines in this work are partly perpendicular and partly sloping to adjust themselves to the widening of the basket. On the extreme

* Sixth Annual Report of the Bureau of Ethnology, 1888, p. 220, fig. 322.

edge, as a finish to the basket, is a false braid in black martynia.

Fig. 201 is a coiled basket bowl of the Pima Indians. The foundation is in shredded material of rush, the sewing in willow and martynia. The ornamentation consists of a black

FIG. 201.
COILED BOWL.
Pima Indians.
Collected by Edward Palmer.

bottom, out of which rise four right-angle triangles, to which is attached a curious fretwork made up of L-shaped elements. There are a number of smaller right-angle triangles worked into the figures at various points, showing that this is a constant idea in the mind of the manufacturer. Diameter, 12¼ inches; height, 4¾ inches.

This specimen, Catalogue No. 76,040 in the United States National Museum, was collected, with many others, in Arizona, by Edward Palmer. Plate 233 is a piece of the same type from the collection of C. E. Rumsey.

Plate 234 represents two Pima basket bowls in the United States National Museum, collected by Dr. Frank Russell, of the Bureau of Ethnology. The foundation, sewing, and border are the same as in other examples. This plate is introduced for the purpose of showing how the basketmaker works out a series of concentric figures whose elements are straight lines mixed with segments of circles. The lower figure is based on a circle in black from which four points project. The concentric rings are based upon this fundamental figure absolutely. From the points, segments of circles increase in length as they proceed outward. From the concave quarter of the central figure circular segments decrease in length as they proceed outward, and the ends of these two sets of segments are connected by ragged straight lines. Finally, the spaces at the four quarters on the rim are filled with small triangles in black. Could anything be more artistic than this association of the simplest elements in basket-weaving?

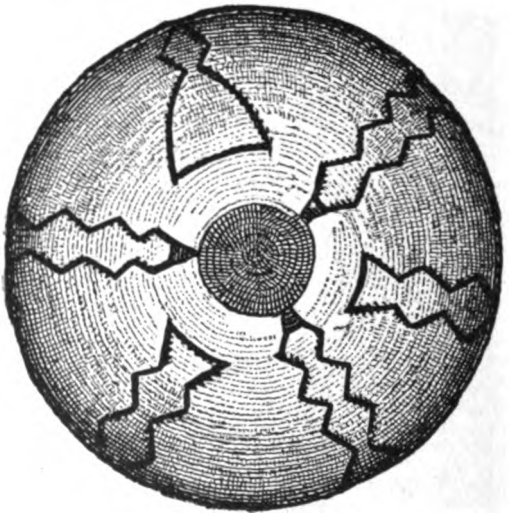


FIG. 202.
COILED BOWL.
Pima Indians.
Collected by Edward Palmer.

The upper figure is on the same sort of foundation, only concentric segments alternate with series of rectangles arranged

Plate 233. See page 478

OLD COILED BOWL OF THE PIMAS, ARIZONA. DESIGNS IN COMPLEX FRETWORK

Collection of C. E. Rumsey

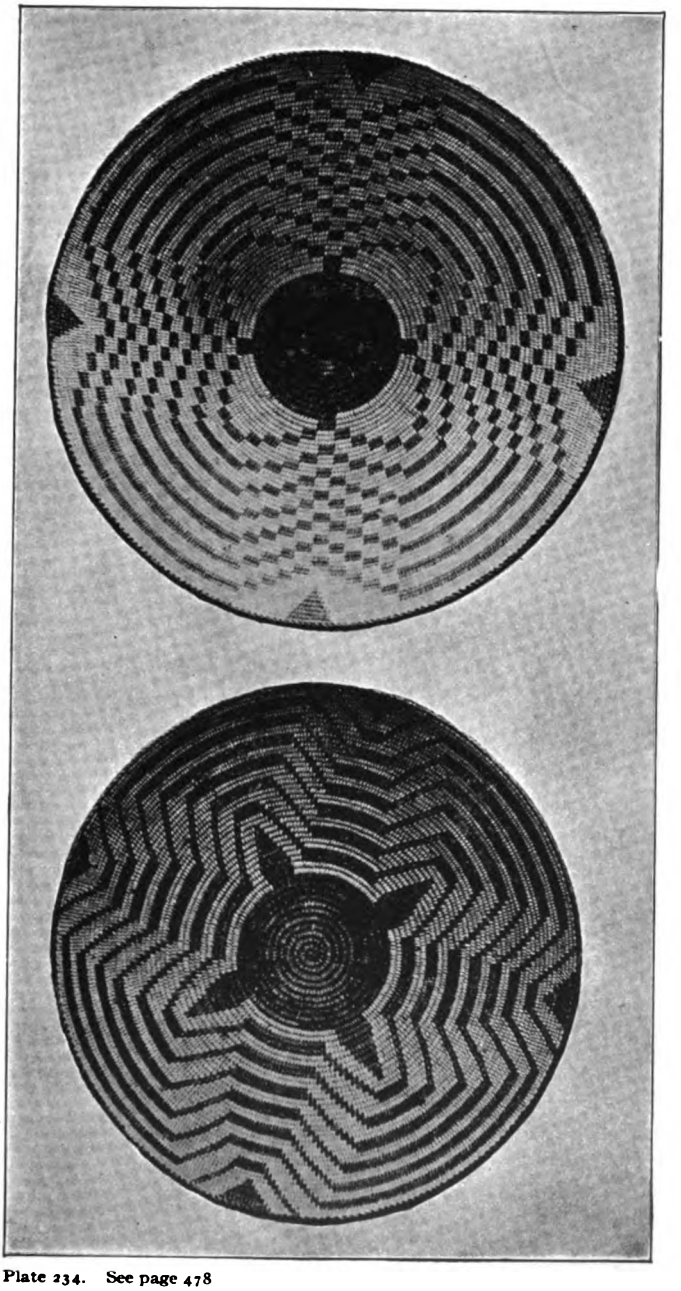


Plate 234. See page 478

COILED BOWLS OF THE PIMAS, ARIZONA

Collections of U. S. National Museum

in checker patterns. These rectangles are all the same size, and are based on the four quarters projecting from the black circle. The widening of the pattern is all accomplished by the lengthening of the circular segments.*

Fig. 202 is a coiled basket bowl of the Pima Indians, Piman family, in southern Arizona. The foundation of the coil is

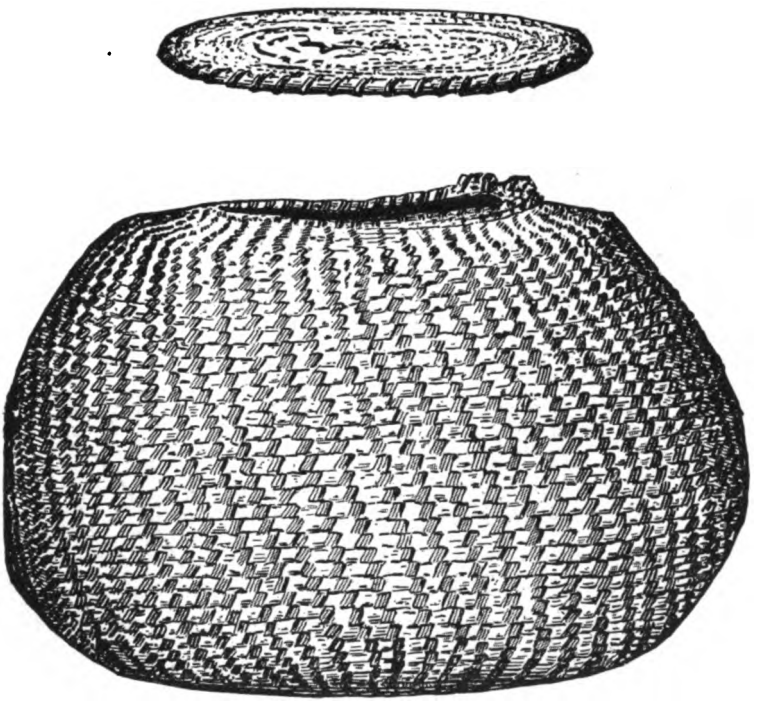


FIG. 203.
COILED GRANARY.
Pima Indians.
Collected by Edward Palmer.

in stems of finely shredded fiber of cattail (*Typha latifolia*). The sewing is in splints of willow, the stitches passing over the foundation and interlocking with those underneath. The sewing material is somewhat rigid, so that the stitches are not pressed home and the foundation shows between. Many of

* Frank Russell, Annual Report of the Bureau of Ethnology (in preparation).

the stitches are split is the sewing, but it does not appear that it is systematically done for the purpose of ornamentation, as is the case with the Salish and Klikitat tribes of the farther north. The designs are in splints of martynia pod. The elements of decoration are in threes, and doubtless have symbolic meanings, but these are not known. Diameter, 11¼ inches; height, 3½ inches.

This specimen, Catalogue No. 5,548 in the United States National Museum, was collected in Arizona by the veteran explorer, Edward Palmer.

Fig. 203 is a small granary of the Pima Indians, Piman family, in coiled work. The foundation is a bundle of wheat straw averaging about half an inch in diameter. The sewing is done in willow bark, the strips varying in width from a quarter to half an inch. No attempt is made to crowd the sewing-material so as to hide the foundation; indeed, this would be impossible because of the width of the willow bark. The effect on the surface is to produce almost perpendicular lines from the center to the border. New rows are added as the coils enlarge.

The Pima Indians live partly on vegetable diet, the fruit of the mesquit and of other plants, and they use the granary baskets on platforms for the purpose of keeping the dried material out of the way of rodents.

To make the detail structure more clear, a square inch is given in fig. 57.

This specimen, Catalogue No. 76,046 in the United States National Museum, was collected in Arizona by Edward Palmer.

Plate 235 represents a Pima basketmaker. The Piman family have been supposed to be the connecting link between the Shoshonean of the Great Interior Basin and the Aztec or Nahuatl family of Mexico. In their present situation, however, they are cut off from the northern Shoshonean by the extension of the Yuman family.

Plate 235. See page 480

PIMA BASKET-MAKER AT WORK IN FRONT OF HER DWELLING, ARIZONA

Photographed by J. W. Benham

MIDDLE AND SOUTH AMERICA

This genius (Clotho) led the souls first to cloths, and drew them within the revolution of the spindle impelled by the hand.— PLATO'S REPUBLIC

On the border line between the Republic of Mexico and the United States is a transition between the standard forms which have hitherto been studied and the more open types of lacework and loomwork. Coiled basketry of well-known varieties continues on southward, both in the lowlands and in the mountainous regions, to within a few miles of the City of Mexico. Variations from these types are also in evidence, both coiled and twined, the former predominating. Foundations of grass more than an inch thick are built into immense baskets for carrying, and also into granaries for holding the crops of seeds and nuts, the sewing being done with wide strips of bark, wood, and leaves. Taking these coarse baskets for a motive, smaller and finer ones are done in better material, but still the stitches are half an inch apart. There is no occasion for surprise in this, since the linguistic families which are represented in Arizona, New Mexico, and California are also continued into the Republic of Mexico. In this area the student is clearly "within the revolution of the spindle." In addition to the coiled work just mentioned will be found coiling of the hammock type, and, interesting to know, the Chippewa on Lake Superior and the Loucheux type on the Mackenzie River are here reproduced in the carrying basket (see fig. 106). Starting out from very plain, coarse varieties of this work, it passes on into the lacework and netted burden baskets of the Pima, Papago, and Mohave. (See Plate 232.) The figures wrought into the lacework baskets are the same as are to be seen in the labyrinthian patterns on the basket bowls of the Pima. Quite as interesting as any of these types, the wrapped weaving before described

is found in burden baskets of the Yuma tribes.* It must be recalled at this point, however, that Hudson mentions the same style of workmanship among the Pomo Indians for roof building and traps, and W. H. Holmes brought from California a framework for carrying birds in which the rods are held in place by a similar wrapping. There is also in the National Museum an old coarse mortar basket made of sticks which are bound together in the same way. A great deal of twilled and wicker work comes from the neighbourhood of the City of Mexico and from Central America, and a species of coiled sewing which exists sporadically all the way from the Arctic Ocean to the Strait of Magellan. The stitch, in addition to passing around the foundations to hold them together, also makes a wrap about the standing part between the coils. Modern coiled ware in great quantities is made up from agave fiber of fine quality, but it resembles African work more than American. A variety of forms and uses exists in baskets in Mexico; among others, the immense hats. The Caribs on the Mosquito coast of Nicaragua are said to have plaited a pretty water-tight basket of reeds, called "patapee," but these people had been in touch with natives of Africa, who knew how to make water-tight baskets from the time of Moses, at least. The Tlaxcala Indians used twined weaving in making slings. Types of work just mentioned continue on into the Central American States. No account is here made of the fine weaving and needlework, in which typical and extraordinary patterns are wrought, because they are across the boundary line, and are no longer in the family of basketry made merely by hand without machinery.

Twined basketry and matting are preserved in the Peabody Museum from prehistoric burial caves in Coahuila,

* To bring together the net-like fiber of this area, the following list will be helpful: (1) The common coil without foundation is universal; (2) The wrapped work, Diegueños, Coahuillas, Mohaves, and other Yuman tribes; (3) Lace work—Pimas, Papagos, Maricopas, and Coras; (4) Netted or knotted carrying receptacles, Mohaves.

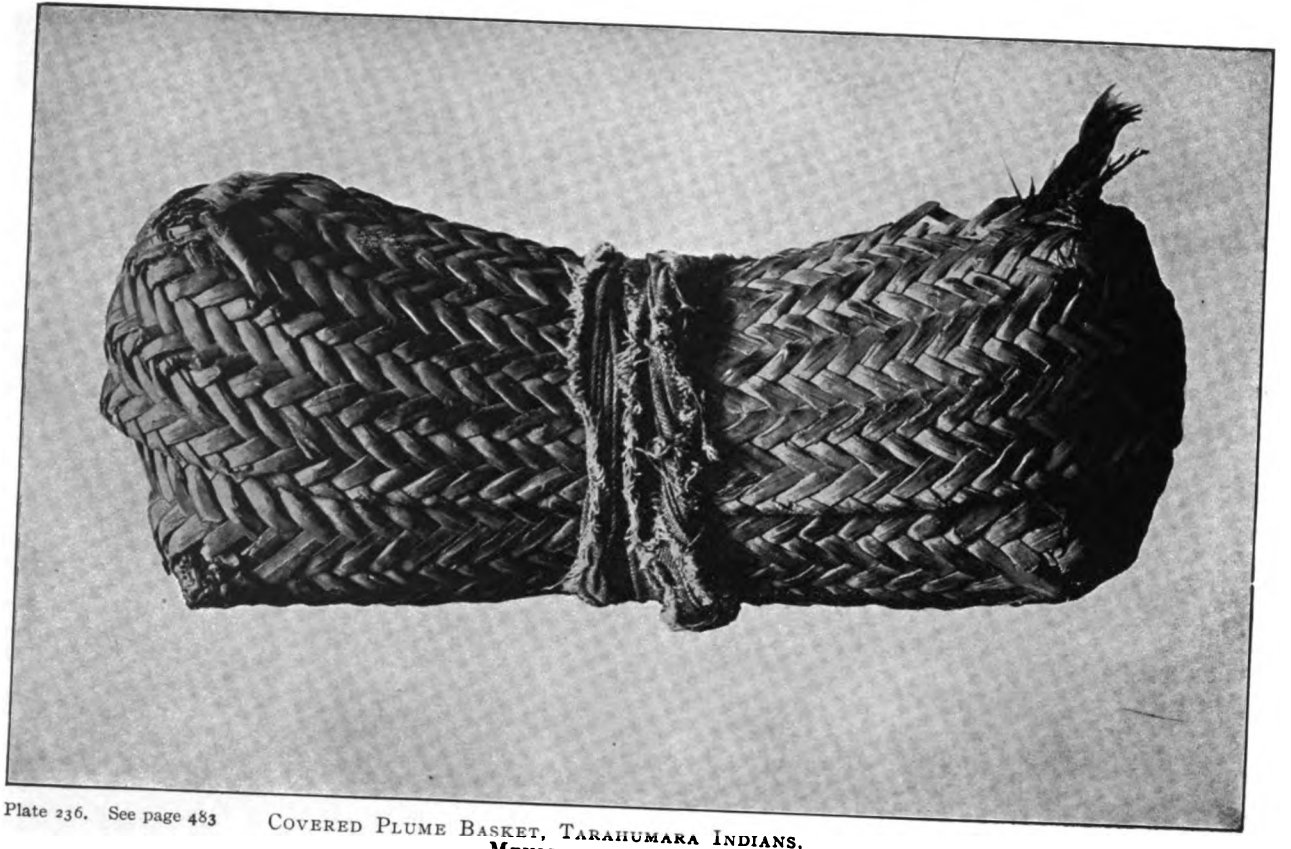


Plate 236. See page 483 COVERED PLUME BASKET, TARAHUMARA INDIANS, MEXICO

Collections of U. S. National Museum

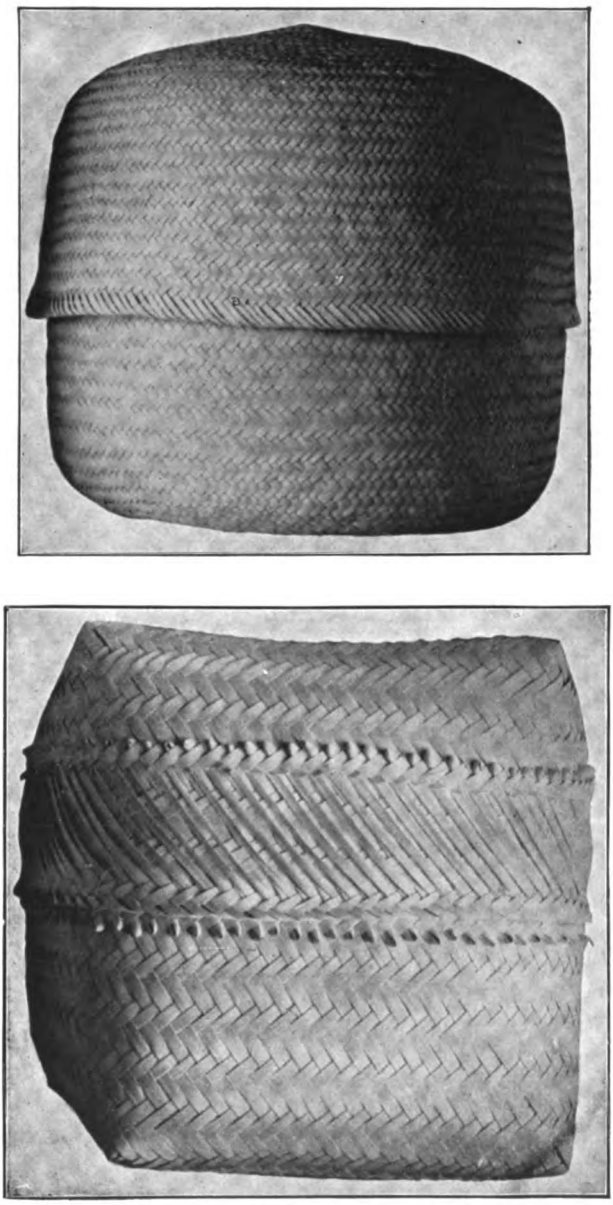


Plate 237. See page 483

YAQUI COVERED BASKETS IN DOUBLE TWILLED WEAVING, SONORA, MEX.

From negatives in Am. Mus. of Nat. Hist., N. Y.

Mexico; among the Tlaxcala Indians (Nahuatlan family) in Central Mexico; from prehistoric graves at Ancon, Peru, and Arica, Chile; from graves at Pisaqua, Chile; from the Guatos Indians (Tapuyan family), in southern Brazil, and from the Cadioes Indians (Guaycuruan family), on the Paragua River. (C. C. Willoughby.)

Plate 236, United States National Museum, was brought by Frank Russell from Tarahumara Indians of northern Mexico. It is in the form of the so-called "telescope trunk," and old specimens of the National Museum were collected many years ago by Edward Palmer. The material is a kind of rush, and the weaving is in twilled work. Such baskets are employed for holding all sorts of useful articles, but especially in connection with religious practices they are the depository of charms and fetish objects.

The Yaquis, of Sonora, Mexico, says Palmer, split the stems of *Arundinaria* for basketry by pounding them carefully with stones. The reeds divide along the lines of least resistance into splints of varying width, which are assorted and used in different textures. They now manufacture to order floor mats, porch screens, and the like, and sell them in Guaymas.

Dr. Hrdlicka spent much time among the Yaquis and brought a varied collection of their basketry to the American Museum of Natural History. They make several varieties, all in twilled weaving. The coarsest are for household use, and have no covers. They are usually quadrilateral, and measure up to twenty-four inches in length. Examples of much finer quality serve for the holding of small objects. These are made in several forms, probably the rarest being cylindrical and covered, never exceeding eighteen inches in diameter. Plate 237 shows two of the specimens mentioned above. They are in narrow splints of the yucca palm of Sonora, and the weaving is double. The work was begun at the bottom, built up to the border, and the process reversed so as to make

another fine basket outside and closely adhering to the first. A more common variety, of better form, is found in many sizes up to twelve inches in height or diameter. They are not double throughout, but a broad decorative band, made of a second layer of fibers, is added to the outside of the body and of the cover. Double baskets are also made in bottle shape, of various sizes, with covers. They are doubtless made for sale. Dr. Hrdlicka obtained a number from Yaqui captives—women confined at Guadalajara. Charming decorative effects are produced on them by the fineness of the filaments, the regularity of the technic, and variations in the twilled weaving. The Yaqui hats are broad-brimmed, with semiglobular tops, all in twilled weaving, and some are of fine quality. They are, in most examples, double, and similar to the *bottles* in the variations of technic.

The Huichole Indians, living in the State of Salisco, Mexico, belong to the Aztecan branch of the great Shoshonean family. They have been described, among others, by Lumholtz, and are living in a state of native simplicity. The few baskets that they make are in twilled weaving, with covers, and are 18 inches or less in length, 4 to 6 in width, and the same in height. Used chiefly to hold ceremonial objects. Similar baskets are woven by the Tarahumara (Piman), State of Chihuahua, and also by the Tepehuanos (Piman) in Durango. These low, tray-shaped, rectangular baskets, with covers, are the common packing cases among these tribes of northern Mexico mentioned. (Hrdlicka.)

A wicker basket from Santa Maria del Rio, fourteen leagues south of San Luis Potosi, Mexico, is Catalogue No. 76,925, United States National Museum, made from the prepared stems of willow. The weaving is not after the fashion of the common market basket, but its parts are worked spirally in such manner that the smaller ends of the stems terminate in a braided band around the top of the body. (Compare fig. 190.) This arrangement reminds one of Dr. Matthews's

Study in Butts and Tips.* The warp consists of groups of fine stems arranged in fours. As the bottom is oblong, five of the groups pass straight across it widthwise, while at the ends others radiate from the foci of the ellipse. The weft of the bottom is formed by means of fourteen stems, seven of which run in one direction and seven in the other, the smaller ends being fastened off on the border. The body is built up in the same way. In the ordinary wicker basket a stem is woven among the warps, and when the end is reached another stem takes its place, and so on; but in this example all the weft stems of the body begin at the very bottom and are wound in a spiral up to the upper margin. At this border, the warp stems are all bent to the right for an inch and a half and then turned back again, being intertwined in a sort of openwork diagonal weaving. To form the handle, seven stems on each side are thrust between the weft, and these bundles are wrapped about each other to form the twisted handle, the smaller ends being deflected so that the ends of the stems which form the body and the ends of the handle and the stems of the body are all woven together to form the braid work at the top. Collected by Edward Palmer.

H. Ling Roth, in his paper on the aborigines of Hispaniola,† says that, although none of the histories make reference to the island in which baskets were manufactured, nor even to the material out of which they are made, there is occasional mention of them, proving that formerly, as now, the Caribs and their tribes knew how to weave basketwork. The Spaniards, both in Hispaniola and Cuba, on several occasions found men's heads cut off and sewed up with great care in small baskets. He quotes Benzoni in speaking of a feast in which baskets were adorned with roses and various flowers. Columbus found baskets, in Guadeloupe, full of men's bones.

* American Anthropologist, Washington, V, 1892, pp. 345–350.

† Journal of the Anthropological Institute of Great Britain and Ireland, XVI, p. 283.

A glance at the map of northern South America shows how easy it is to pass from the Windward Islands up the Orinoco and over the drainage of the Rio Negro, down to the Amazon. On this central position it is not difficult to make communication with the highlands of middle Brazil, Bolivia, eastern Peru, and Ecuador, and to pass from the Xingu River to Paraguay is easy. This explanation will clear the way for the collection of baskets now to be described.

The seventieth parallel from Greenwich may be used to divide South America into east and west basketry sub-areas. The West Indies will be counted with the eastern portions. The few widespread linguistic families serve as a bond to hold the tribes in mind. At the extreme north, the Carib and the Arawak are conspicuous; the Tupi-Guarani and the Geez answer for Brazil; over the Amazon watershed, the La Plata areas, the Gran Chaco tribes follow. Patagonia and Fuegia complete the series. Over a large portion of this eastern region the types of weaving practised in the southern States of the Union prevail. On the western side of the continent, in the Andean valleys, the basketry is more varied and interesting, as the description and illustrations will show. The information which follows is far from complete. The little said will serve at least as a starting point, and show that, aboriginally and technically, there was only one America.

Plate 238 shows an Indian woman standing in front of the agave plant—a fitting combination, since in Mexico, Central America, and northern portions of South America the agave is to the native population an enduring friend. In modern industries it has not lost its influence. The lechiguilla, ixtl, sisal, and other standard fibers are therefrom. In old times it was the substance from which receptacles, clothing, parts of household utensils and conveniences, and many other useful things were made. The figure standing in front of the plant might be called the Clotho of the agave, whose

Plate 238. See page 486

INDIAN BASKET-MAKER STANDING IN FRONT OF HER PLANT, VENEZUELA

Photograph from R. Bartleman

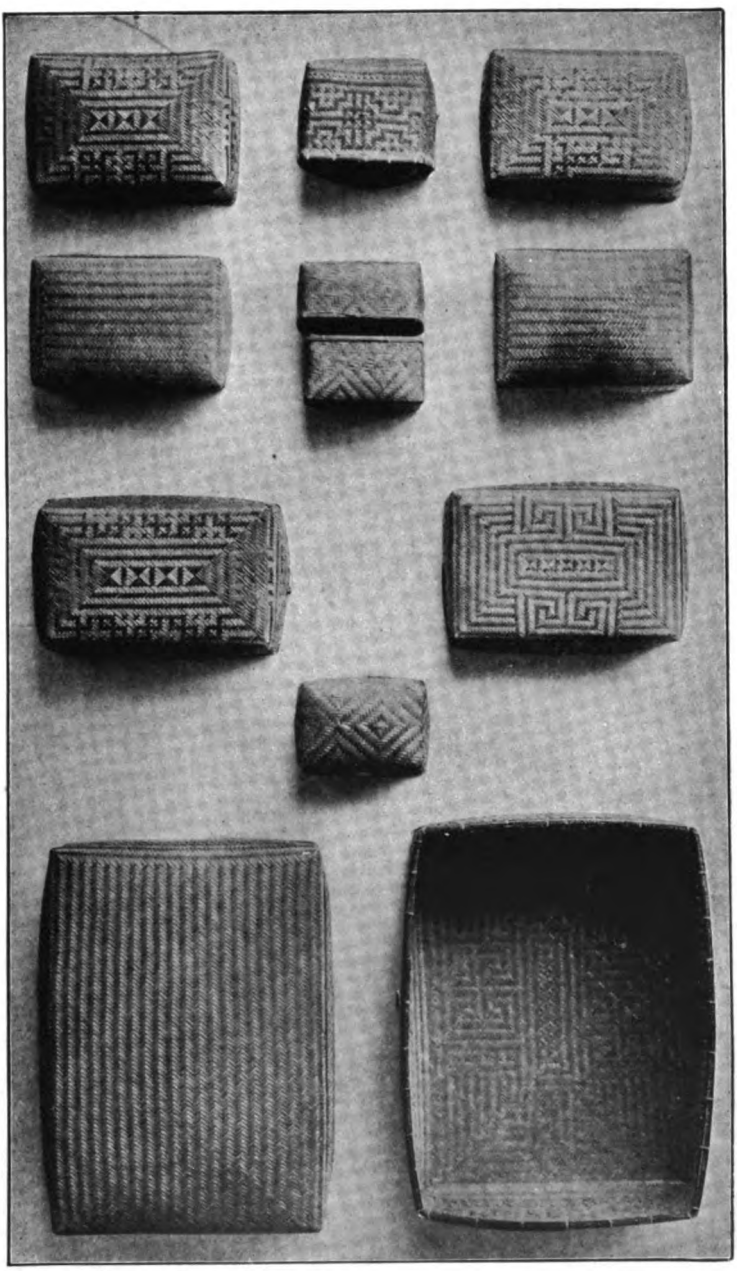


Plate 239. See page 487

TWILLED BASKETRY OF THE ARAWAK INDIANS, BRITISH GUIANA

Collected by R. Figyelmesey, for U. S. National Museum

skilful fingers will turn the ideal plant into many supplies of wants.

Baskets from British Guiana are like those described by E. F. im Thurn in his work entitled Among the Indians of British Guiana. The specimens in the National Museum are all of the twilled pattern, wrought from a brown vegetable fiber that shows the same on both sides. This twill is used with good effect in the diagonally woven cassava strainers, widely distributed, which may be contracted in length by a corresponding increase of width. When the cassava is packed into this strainer the latter is suspended and a great weight fastened to the bottom. The same device is used among us by country housewives in making curds. There is an entire lack of gaudy dyes in the Guiana baskets, the only colours being the natural hue of the wood and a jet-black varnish. The gorgeous plumage of the birds replaces the dyes in ornamentation. (See Plate 239.)

The material used for basketwork among the Indians of Guiana is the split stem of a kind of maranta (*Ischnosiphon*) called iturite by the Indians. For rough work, other species of iturite are used, and for the roughest of all the unsplit stems of certain creepers, especially one called by the Indians mamamoorie (*Carludovica plumierii*).

The so-called pegalls (packalls) are generally square. The basket and lid are the same shape; the latter, being larger, slips over the former and entirely covers it. Many Caribs make their pegalls of an oblong shape, with gracefully curved lines, and adorn them with long strings of thick, white cotton on which are knots of coloured feathers. Sometimes the true Caribs make the pegall and lid double, and between the two layers of basketwork certain leaves (*Ischnosiphon*) are inserted to make the whole waterproof. Here is another example of double weaving noted in several parts of North America.

Another basket, shaped like a slipper, is the suriana, for carrying heavy loads. This useful form has a wide distribu-

tion, being seen in Guatemala. The "quake," another basket, is used for storing provisions. It also serves as a cage. It is made of open wickerwork, with a rounded bottom. Most of the baskets are manufactured in the same way and of the same material. The Nikari karus, living on the Brazilian borders, make their pegalls of the leaves of the palm (*Orbigna*), very rare in British Guiana. These are square or oblong.*

Plates 240 and 241 are from photographs presented by the distinguished ethnologist, Dr. Carl von den Steinen. They represent carrying baskets from eastern Brazil in the collection of the Berlin Ethnographic Museum. In order to bring the structure into comparison, baskets of the same functions were selected. The following descriptions, aided by the photographs, will make plain the structure.

Plate 240, fig. 1, is a carrying basket (hasiri) of the Jamamadi Indians, living on the Rio Purus, in the collection of Paul Ehrenreich. The warp is crossed, and the weft passes through the warp in regular order, so as to produce hexagonal openings. The border is formed by simply turning over the ends of the warp and weaving them backward. The head strap is a wide strip of inner bark. Prof. J. B. Steere collected for the United States National Museum a fine specimen of this same type of weaving of the Jamamadi, resembling, in fact, fig. 2 of this plate. (See Plate 95, fig. 5.)

Fig. 2 is a carrying basket (shibati) of the Hypurina Indians, living on the Rio Purus, collected by Paul Ehrenreich. The warp is crossed and the weaving is done as in fig. 1, but there are twice as many weft splints, the hexagonal spaces being crossed by them. The border is formed of a hoop of wood. Strips are attached to the side of the basket for strength, and string loops at the top for attachment of the head band, which is in tough inner bark of a tree, as in No. 1.

Fig. 3 is a carrying basket (koho) from the Paressi Indians,

* E. F. im Thurn, Among the Indians of British Guiana, p. 282, London, 1883.

on the upper Tapajoz River, Brazil, in the collection of Dr. Carl von den Steinen. This is an elegant piece of work and worthy of study. One-half of the warp elements are vertical and the other inclined. The weft passes through the interstices formed by the crossed warp in twos and threes. At the top, a hoop is used for strengthening, the warp turned back and held firm by a single row of three-strand weaving. On the sides, a rope is attached to the weft elements for loops, and the head band is made, as in the other specimens, from the tough inner bark of a tree.

Fig. 4 is a child's carrying basket (mayaku) of the Bakairi Indians, on the upper Xingu River, Brazil, and fig. 5, an example for adults by the same tribe, from the collection of Dr. von den Steinen. They are made of four elongated hoops of wood. One furnishes the bed or bottom of the frame, two others the sides, and the smaller one the end. Those who are accustomed to studying utensils used in transportation will recognise in these two frames African forms. They are not basketwork, either of them, in the strict sense of the word, since the webbing which fills up the hoops is true network of string; the crossings form regular knots. In both examples the head band is of bast or the inner bark of a tree, and in the larger the binding of the bottom is in the same material.

Plate 241, fig. 1, is a carrying basket (kodrabo) of the Bororo' Indians, on the Rio São Lourenço, Brazil, in the collection of Dr. von den Steinen. It is in palm leaf, in regular twilled weaving common throughout the world. The interesting portion, not to be overlooked, is the border, which is the midrib of the palm leaf, with the leaflets attached. The carrying band, or head band, as in other examples, is in tough inner bark of a tree.

Fig. 2 is a carrying basket of the Kabischi Indians, on the upper Xingu River, in the collection of Hermann Meyer, found in an abandoned camp. The weaving is in twilled work, forming rhomboidal patterns on the surface. The top of the

basket is round, and strengthened with a hoop. The bottom is square, held in shape by sticks, and carried by means of a head band of bark.

Fig. 3 is a carrying basket of the Kaingua Indians, on the Rio Alto Paraná, collected by Rohde Ambrosetti in southern Brazil. It is an elaborate specimen, built on a framework, with a round hoop at the top and two oxbow-shaped pieces of wood crossing under the bottom to give shape to the body. The upper part of the surface is in wickerwork. A band around the middle in twilled weaving is ornamented with rhomboidal patterns, and the lower part is also covered with wickerwork. The head band is in tough bark.

FIG. 204.
CARRYING NET.
Araucanian Indians.

Fig. 4 is a carrying basket (apoi) made by the Warrau Indians, on the Rio Orinoco-Cuyuni in Guiana. The framework and covering are interesting on account of the distribution of this peculiar form, which may be found as far north as Guatemala and around the Caribbean Sea. The work is in twilled weaving, and the border is formed by strips of wood sewed to the upper edge. The head band is in two-strand rope.

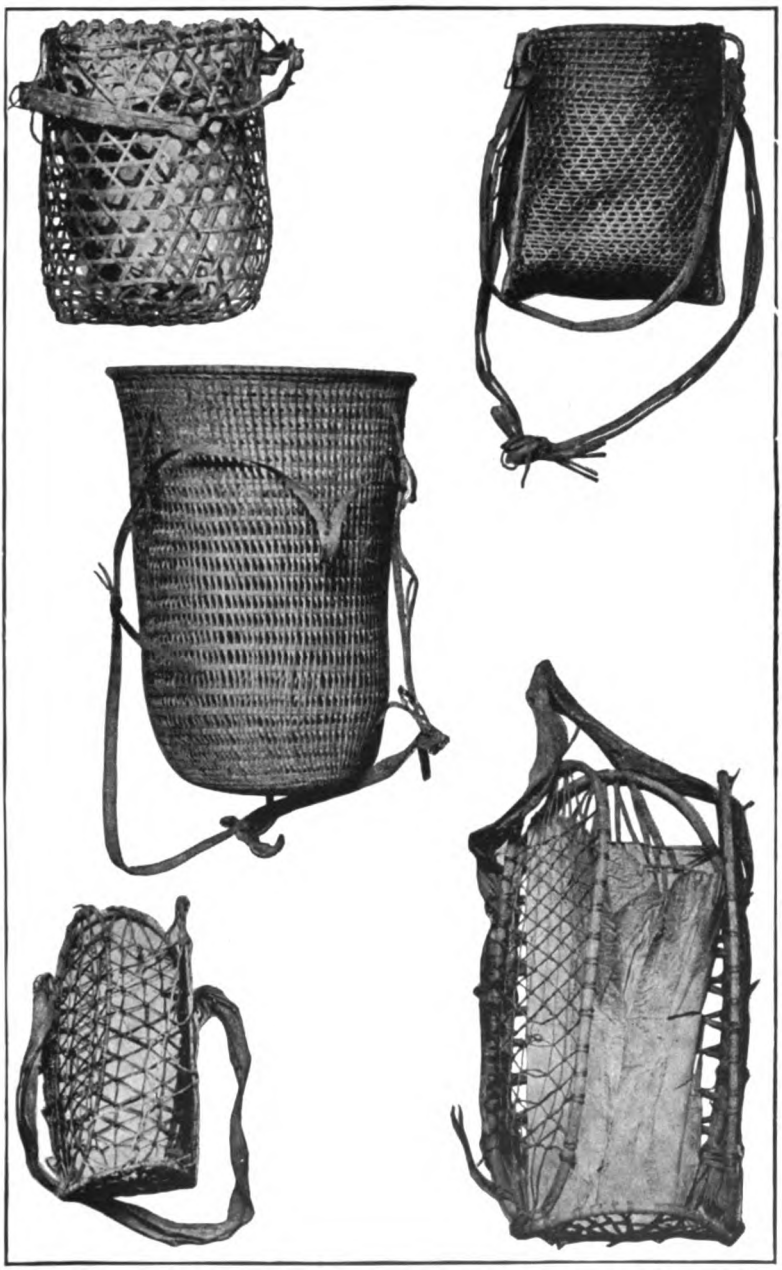


Plate 240. See page 488

1 2
3
4 5

DIFFERENT FORMS OF CARRYING BASKETS OF BRAZILIAN TRIBES

Photograph from Carl von den Steinen, Berlin Museum of Ethnography

Plate 241. See page 489

DIFFERENT FORMS OF CARRYING BASKETS OF BRAZILIAN TRIBES

1 2 3 4

Photograph from Carl von den Steinen, Berlin Museum of Ethnography

Nieuhoff describes the Brazilian basketry of his day.*

The baskets of the Indians of southern Brazil are made of palm-tree leaves. They call them patigua. They have also some made of reed or of cane. These are with one general name called karamemoa. They make also large broad baskets of reeds and branches twisted together. These they call panaku, and are chiefly used for the carrying of the mandioka root. In their journeys they always make use of the patigua, but the panaku is used by the slaves and negroes in the Receif for the convenience of carriage.

The Guatos Indians in southern Brazil employ twined weaving in the manufacture of mantles, and the Cadricios Indians on the Paragua River make grass bags in the same technic.

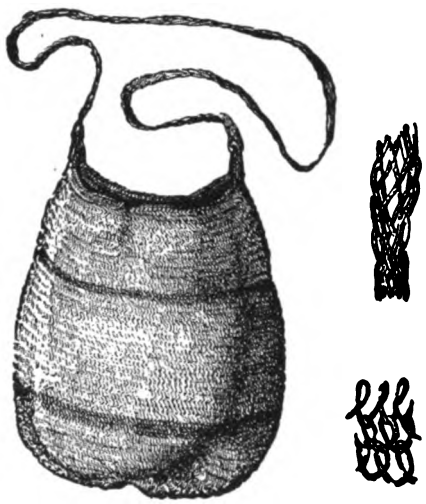


FIG. 205.
CARRYING NET.
Chiriqui, Columbia.

The figure of an Araucanian woman acting as both freight and passenger carrier is introduced from De Schryver† to show the extension of the button-hole stitch technic southward. The insertion of a foundation in coiled work is not common farther north, but will be again noted at the very extremity of the continent. (See fig. 204.) The basketry of South America reaches its southern limit in the Fuegian coiled ware with slight foundation and sewing in button-hole stitches, illustrated in Fig. 59.

Coming over to the western side of the continent, fig.

* Voyages in Brazil, in Churchill, II, p. 132.

† Simon de Schryver, Royaume d'Araucanie-Patagonie, 1887.

205 is a coiled carrying bag from Chiriqui, Colombia, and is a type of an enormous amount of ware to be found in Middle America, North America, and South America. It is represented in fig. 42, and is called in this monograph coiled work without foundation. It will be seen, by looking at the detail, that the twine constituting the fabric interlocks with the stitch underneath and makes a complete revolution, catching the next stitch, and so on. Without definite information on the subject, it is believed that in making these bags some sort of a gauge is used by the weaver—a small stick, which may be slipped along as the work proceeds.

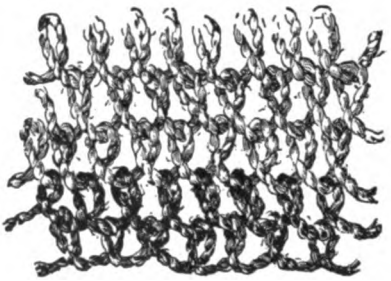


FIG. 206.
DETAIL OF FIG. 205.

The detail is shown in fig. 206, and especial attention is called to the ornamental effect of using a two-ply twine and the additional decorative feature of having the twines in different colours.

The fibers of the Middle Americans and Mexicans are of the best kind and texture, and are used in hammocks and for the most exacting labour in transportation.

An interesting example of the friendly coöperation between the best material and the best workmen is to be found in the Republic of Ecuador in the manufacture of the so-called Panama hat. In August, 1900, Consul Perry M. de Leon, of Guyaquil, gave the following account of it: The Manavi (Panama) hat was first made in the province of Manavi, Ecuador, about 275 years ago, by a native named Francisco Delgado. The present centers of the industry are Monte Cristi and Jipijapi in the province of Manavi, and Santa Elena and Cuenca in the provinces of Guayas and Azuay, respectively. They came to be known as Panama hats years ago, when that city was a distributing center. Those who are

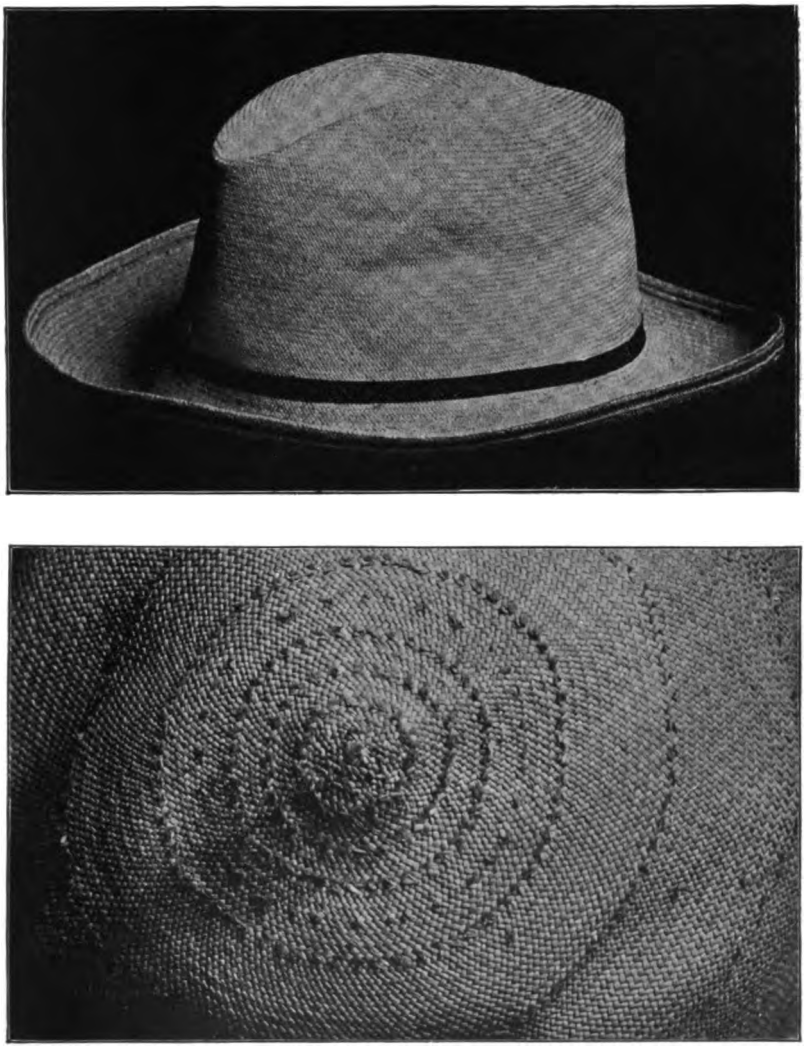


Plate 242. See page 493

ECUADOR, OR PANAMA. HAT OF PALM LEAF IN CHECKER WEAVING

Collection of S. O. Richey

familiar with them can tell by the method of beginning the weaving at the center of the crown the locality where the work is done. In Ecuador, Colombia, and Central America the hat is known to the natives as the Jipijapi (pronounced hipi-hapi), but as they are made elsewhere in Ecuador, principally in the province of Manavi, and as the name is easy to pronounce, it might take the place of the present misleading appellation. (See Plate 242.)

They are made from a native species of palm (*Carludovica palmata*), cultivated in the provinces of Manavi and Guayas, and known as "paja toquilla." In appearance it resembles very much the saw palmetto, and is fan-like in shape. Low-lying wet land is selected and the seed planted in rows during the rainy season. When the plant attains a height of 4½ or 5 feet it is cut just before ripening. The leaves are boiled in hot water, and after being thoroughly sun-dried are assorted and ready for use.

The material is first carefully selected, dampened to make it pliable, then very finely divided into requisite widths, the little finger and thumb nail being used for the purpose. The very finest specimens are prepared from delicate leaves that need no splitting or stiffening. The plaiting begins at the apex of the crown, and is continued in circular form until the hat is finished. The story that they are made under water by candle light is untrue. The work is carried on while the atmosphere is humid, from about midnight to seven o'clock in the morning. At night the hat is hung out in the open air so that the dew may fall upon it, and it is then in condition to be worked the next day. If the strand breaks, it can be replaced and so plaited as not to affect the work nor be visible to the naked eye. The ingenious woman uses her knee for a head-block. It requires from three to five months daily labour of three hours a day to make one of the finest hats. The business in its highest development is really an art, requiring patience, fine sight, and special skill—qualifications few of

the natives possess. The plaiting completed, the hat is washed in clean, cold water, coated with a thin solution of gum, and polished with dry powdered sulphur. They are so pliable that they can be rolled up without injury and put in one's pocket. They will last for years, and can be repeatedly cleaned.

Natives of both sexes and all ages are engaged at odd times, the business being a side issue. Children make from raw, undressed straw about two of the common hats a day.

The specimen here shown is in the collection of Dr. S. O. Richey, of Washington City, and has twenty or more crossings to the linear inch. The hats vary from the ordinary form having eighteen crossings or checks to the finest quality, which have twice as many. In the market they are sold at from $10 to $150. The most costly specimens are those in which there is not a break in the straw, mismatched colour, or a knot showing in the work.

During the nineteenth century the cemeteries of Peru yielded the greatest abundance of relics and remains. Among the former were a mixed variety of textiles, which were types of basketry hereafter to be described. The climate of Peru is arid, and the land almost a desert like that of Arizona or Egypt. The frail products of the textile industry that might have perished utterly in North America almost everywhere have here all been preserved. Fine specimens of old Peruvian work are to be seen in all the leading museums of the world. The Field Columbian Museum, in Chicago, is especially rich in productions of this kind, gathered through the agency of the World's Columbian Exposition in 1893.

In the Peabody Museum and in the United States National Museum also are fine old collections brought home fifty years ago by earlier travellers and explorers in South America, and in this Peruvian basketware are to be seen not only great varieties in form and exhaustive treatment of native technical processes, but adaptations to uses without number, extending literally from the cradle to the grave.

The name Peru has for the ethnologist a long perspective in time, reaching through many centuries; in elevation it covers the range of habitable areas from reeking sea-coasts to heights barely endurable by man. In coast line it stretches through fifteen degrees of south latitude (5° to 20°). Only in width is it restricted to the narrow watershed of the Andes and a slight portion of the incline on the eastern side, reaching down to the forest line. The most celebrated of the explorations in this area have been by Reiss, Stübel, and Kappel.*

The authors figure the following-named types of basketry:

1. Checkerwork: In this connection should be noted a kind of openwork in which the warps are set at an angle of 45 degrees, running in two directions, forming diamond-shaped spaces. A weft passes around among these warps so as to divide the diamond-shaped spaces into triangles. Such weaving is seen in many specimens of the North Pacific area; even the Aleutian Islanders practise it. It has been already described and figured in von den Steinen's plates for the eastern area.

2. Wickerwork, in Colombia and Uruguay.

3. Diagonal or twilled work, widely diffused.

4. Twined work has been recovered from prehistoric graves at Ancon, Peru, in matting, both coarse and fine, and on baskets; from prehistoric graves at Arica, Chile, in the structure of small wallets of basketry; and from graves at Pisagua, Chile, in baskets. On other styles of manufacture a row or two intrude themselves.

5. Coiled work without foundation is universally distributed. With foundation of fine splints it occurs also, as will be seen.†

In the plates of these authors the following-named technical processes will be seen:

Plate 8, fig. 1, wickerwork basket from Bogota, Colombia.

* Kultur und Industrie Südamerikanischer Völker, Berlin, 1889.

† Compare Nos. 13,039 and 13,096 in Eleventh Annual Report of the Peabody Museum, p. 280, fig. 3; p. 292, fig. 18.

Fig. 2, crossed warp, open weaving, from Pasto, Colombia.

Fig. 3, diagonal weaving from Pasto, Colombia.

Fig. 4, twilled weaving from Panama.

Fig. 5, wicker from Andaqui, Colombia.

Figs. 6 and 7, diagonal weaving from Otavalio, Colombia.

Fig. 8, twilled weaving from Bogota, Colombia.

Fig. 9, coiled basketry from Copacabana, Bolivia.

Fig. 10, diagonal weaving from Quito, Ecuador.

Figs. 11 and 12, twilled weaving from Rio de Janeiro, Brazil.

Fig. 13, coarse, diagonal weaving from Guallabamba, Ecuador.

Fig. 14, open coiled basket box from Bogota, Colombia.

Fig. 15, plaited fans from Cocamilla Indians, Peru.

Fig. 16, diagonal weaving, fan, Papayan, Colombia.

Fig. 17, checker, oblique weaving, from Cocamilla Indians, Peru.

Fig. 18, wicker strainer for maté, from Cerro Largo, Uruguay.

Fig. 19, diagonal weaving, tray, from Brazil.

Figs. 207 to 211 are twilled basketry, found deposited with the dead in a cemetery at Ancon, Peru. They are made of rushes, and exhibit a great variety of forms, as may be seen by examining the drawings on the cover of fig. 207. Across the middle are two rows of ordinary over-two twilled weaving, seen also in detail in fig. 208. A noticeable feature on other specimens, however, to which attention is drawn by Holmes,* and to which he gives the name diagonal combination, is the production of triangular figures. The weaver, in going from right to left, produces the effect of right-angle triangles, but in returning so regulates the decussations of the fibers as to give to the pairs of triangles of the two rows a common hypothenuse. The effect of this combination is magical, leaving the impression of high relief. (Fig. 209.)

* W. H. Holmes, A Study in the Textile Art, Sixth Annual Report of the Bureau of American Ethnology, p. 206, figs. 297–299.

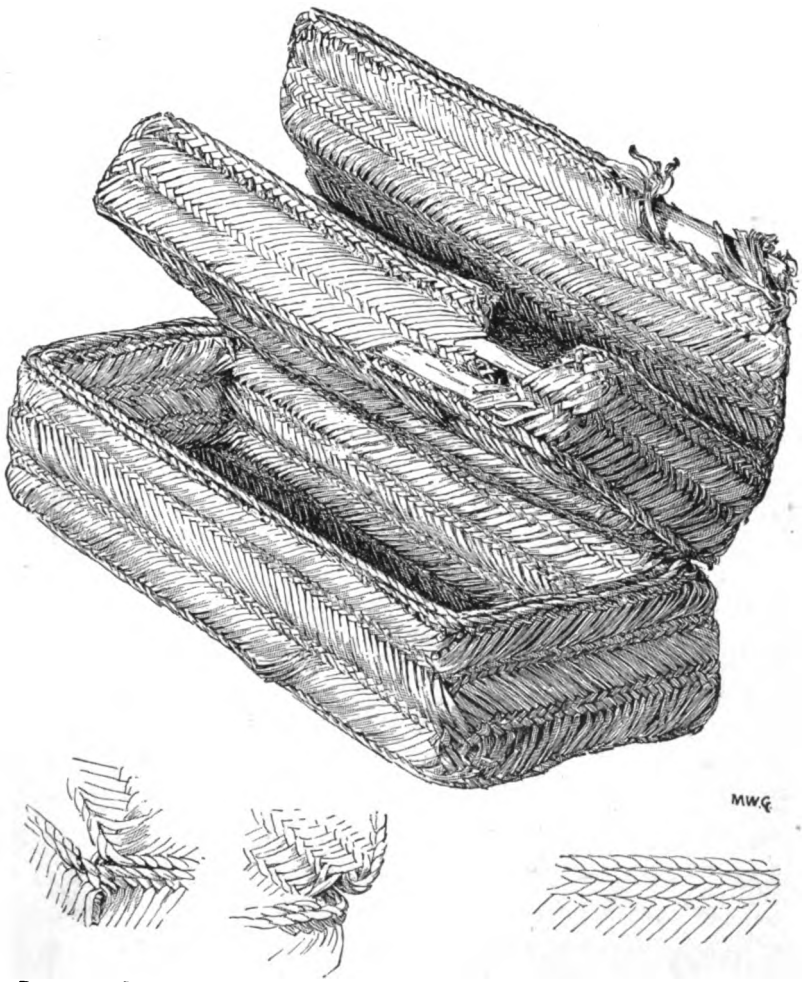


Plate 243. See page 497

ANCIENT WORK-BASKET OF PERUVIAN SPINNER IN FINE WOOL

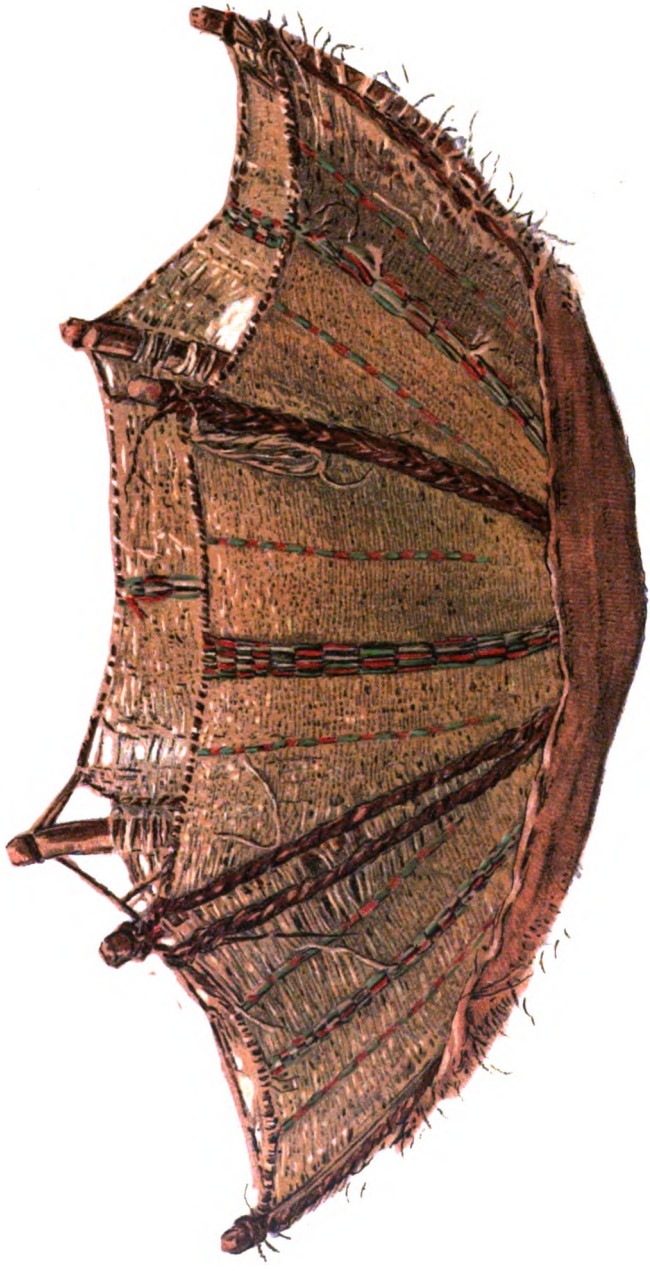
Collections of U. S. National Museum

Plate 244. See page 497

PERUVIAN ANCIENT CARRYING FRAME

In wrapped and twined weaving, from a grave in Iquique

Field Columbian Museum



But the most charming effects in these Peruvian work-baskets are brought about by the use of narrow strips of wood, over which the plaiting takes place and by which broad bands of twilled work are produced. This result is manifest in figs. 210 and 211.

Another characteristic of this Peruvian work is the hinging of the cover of the basket as part of the weaving. In Plate 243, evidently the work-basket of an ancient spinner in Vicuña

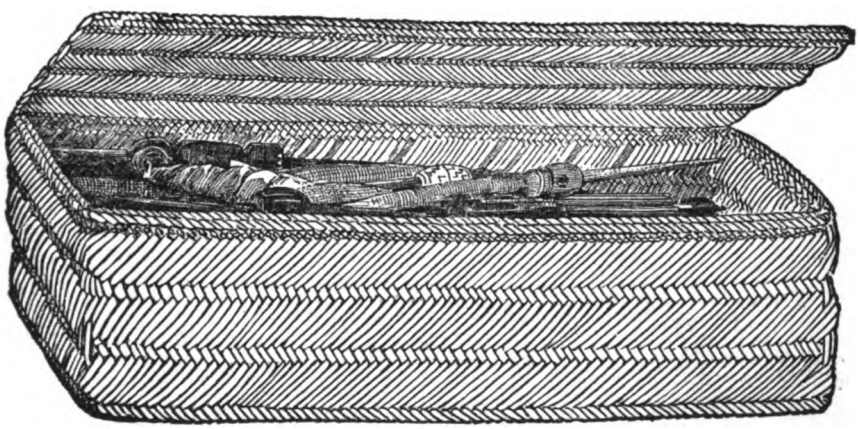


FIG. 207.
ANCIENT PERUVIAN WORK-BASKET.
After W. H. Holmes.

wool, there is a single cover, but it will be seen that the modern compartment trunk has been anticipated, the basket being in three divisions, the middle one forming the cover of the lower one. The detail of the hinge as a part of the texture may be seen in the small drawings at the bottom of the plate.

Plate 244 is a twined carrying frame, from the graves of Iquique, southern Peru. The framework consists of three sticks, bent in the shape of an oxbow, crossing each other at the bottom so as to give to the top the form of an oblique hexagon. The ends are held in place by a stout cord of hair, in natural brown colour. The warp of this basket is formed by winding a white string round and round these sticks on the

outside, the turns about one-eighth of an inch apart, from the bottom to the top. The weft is a series of vertical rows of twined weaving, in some places close together, and in others

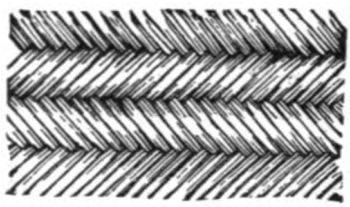


FIG. 208.
DETAIL OF FIG. 207.
After W. H. Holmes.

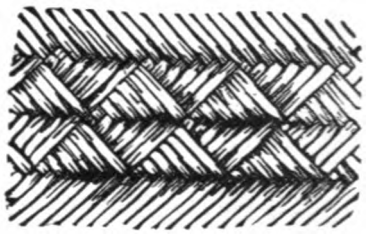


FIG. 209.
DETAIL OF A PERUVIAN BASKET.
After W. H. Holmes.

wide apart, for ornamental effect. The vertical stripes seen on the surface are in green, red, black, and white twine, each block including two or more warp strands. By using two colours in the twine the patterns are variegated on the surface, first the white and then the coloured strand coming into view. By comparing these specimens with the one from the Arikara Indians, fig. 125, it will be seen that, in the latter, two of the bows projected downward and formed the bottom, on which the basket rests. But in this case no such protection is afforded. The woman has sewed a coarse piece of woven stuff along the bottom as a protection for the more delicate threads. The specimen is in the Field Columbian Museum, Chicago, and the coloured plate was furnished by Doctor George A. Dorsey.

FIG. 210.
DETAIL OF A PERUVIAN BASKET.

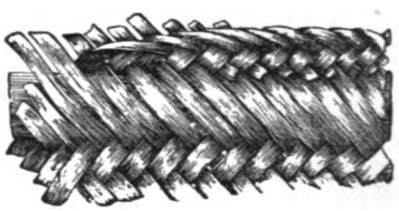


FIG. 211.
DETAIL OF A PERUVIAN BASKET.

Fig. 212 is a fragment of a coiled basket from a copper mine in the district of Chuquicamata, in the desert of Atacama, Chile. It was found, together with other industrial implements, associated with the body of a woman, who undoubtedly met her death on the spot. From the dislocated backbone and the small stones embedded in the skin it is supposed that she was buried by a caving in of the works. The basket, of which this is a fragment, was in every respect similar to the

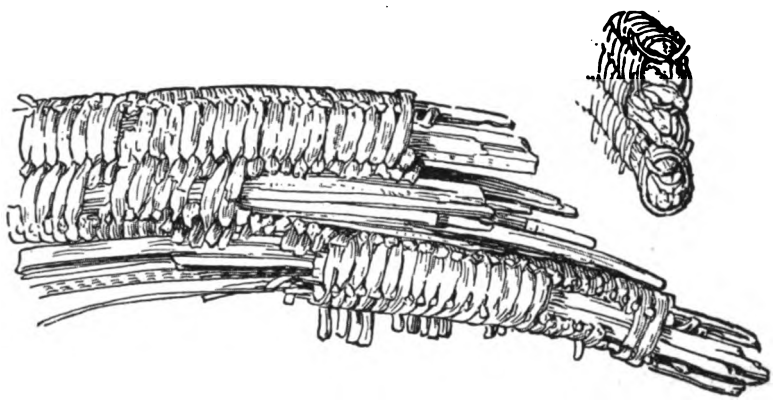


FIG. 212.
ANCIENT COILED BASKET FROM CHILE.

Pima ware in southern Arizona. This fragment bears such remarkable similarity to Pima workmanship that J. W. Benham, of Arizona, who is most familiar with it, was struck with the Chilean example, and wondered whether it were possible that the Pima Indians and the maker of this specimen could have been under the same instructors.

Plates 245 to 247 are also specimens of coiled work, exhibited at the Pan-American Exposition, with the mummy from Chile; the foundation of the coil of shredded material and the sewing also in soft splints. The stitches pass over the foundation, and are not only interlocking, but take up a portion of the foundation in its base below. These should be compared with the specimens from northern Mexico, in the Peabody Museum, described by C. C. Willoughby.

Plate 248 is the side and bottom view of a coiled basket from Peru. The style is entirely modern, but it is introduced here to show two features in technic, well wrought out in the northern continent. The foundation and the sewing are both in a brilliant-coloured straw, species unknown. Sewing is reduced to the minimum, most of the foundation being neatly wrapped, or served with the sewing-material. The stitches on the body are bifurcated most neatly, and, coming one above the other, give the impression of herring-bone work done vertically. Finding this openwork coil and furcate stitches in Eskimo land, California, and Peru, would tempt one to see the same invention arising independently in regions wide apart; but, omitting the unlimited going about in pre-Columbian times, during hundreds of years the sovereigns of Spain, France, England, and for a century Russia, mixed the native tribes and their industries. Catalogue No. 150,844, United States National Museum.

The two areas of South America, eastern and western, unite in the Strait of Magellan. There are three linguistic families of Indians, among whom two types of basketry are found belonging to the coiled variety. They are made by women of *Juncus magellanicus*. Descriptions and figures of the stitches involved will be found in the Revue d'Ethnographie.* See also Lovisto.† The rim is made of wood, veya or tshelia. The specimens in the United States National Museum are all of one variety, the sewing being in the button-hole stitch, so called, and in openwork. Nothing of the kind exists in the neighbourhood, so that it is within the limits of possibility that the style of technic was introduced.

In summing up what has been said on basketry in the Western Hemisphere, it would seem that nearly all the types and processes known throughout the world are to be seen here.

* Paris, IV, p. 517.

† Guida Cora's Cosmos, October, 1884, pl. v.

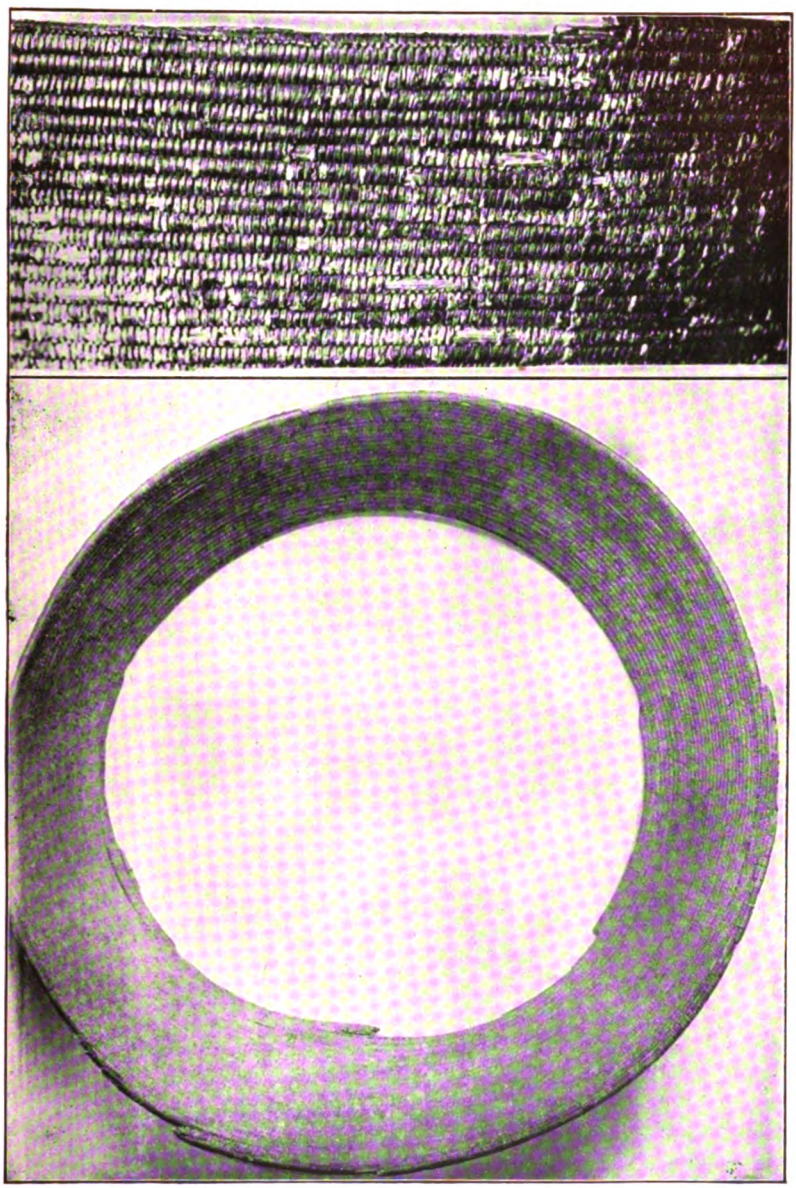


Plate 245. See page 499

FRAGMENT OF ANCIENT COILED BASKET, FOUND IN COPPER MINE, CHILE

Exhibited in Buffalo Exposition

CHAPTER VIII

Collectors and Collections

As David and the Sibyl say.—Thomas of Celano

Basketry and pottery are the sibylline leaves on which are written the thoughts and lore of our Indians. Already much has gone beyond recovery; it is for this reason that a good word is here spoken for those lovers of art who have spent time and means in redeeming the more perishable of the two treasures from destruction. Pottery may be broken, but its fragments endure and bear witness. Not so basketry; made of the most perishable portions of plants, it can endure only when in contact with preservative materials, or partly reduced to ashes, or deposited in caves and other dry places; or finally, their technic, but not their story, may be saved by impressions left on pottery.

The following instructions are published for the great number of persons who are interested in the collection and preservation of American basketry. Besides the esthetic elements involved and the pride of saving the best examples of a rapidly vanishing industry, there is a vast deal of culture study which ought not to be neglected.

In every collection, public or private, there are opportunities for special investigation that should not be in the possession of a single individual only. If all who are gathering baskets would preserve such information as they may be able to obtain, the bringing together of the results of all this study would be a monument for our American aboriginal women.

As pointed out in former chapters, knowledge concerning basketry seems to be illimitable, the technician, the artist,

and the student of folk-lore finding equal pleasure in the acquisition. To begin with the manufacture, a correct knowledge of the materials includes the name of the tribe and their location, the name of the different kinds of weaving in the native tongue, and chiefly the native name, the common name, and the scientific name of every plant or animal substance or mineral involved. The reason for this is that in order to know whether an art is indigenous or acquired, it is necessary to compare the names for definite things with those used by other tribes for the same things. Not to discourage the collector, however, it must be said that this is merely an ideal toward which we ought to work.

The following label of a specimen in the Hudson basketry collection, United States National Museum, will serve as a model to guide the collector in saving information about his specimens:

BASKET JAR of the Pomo Indians (Kulanapan family). Made from the prepared root of Kahum, or California sedge (*Carex barbarae*), throat and scalp feathers of Katátch, or woodpecker (*Melanerpes formicivorus*), breast feathers of Jucil, or meadow lark (*Sturnella neglecta*), scalp feathers of Kayán, or mallard (*Anas borchas*), plumes of Tchikáka, or crested quail (*Lophortyx californicus*), neck feathers of Tsawálu, or jay (*Cyanura stelleri*), and Káya, or prepared clam-shell (*Saxidomus gracilis*), in a style of coiled sewing called Tsai, in which a single rod constitutes the basis. The sewing passes over this rod, under the preceding one, and locks in the stitch immediately underneath. Ornamentation, a row of shell disks around the margin and another row serving as a handle.

Diameter, 5 inches.

RUSSIAN RIVER, CALIFORNIA, 1896. No. 203,415.

FROM THE BUREAU OF AMERICAN ETHNOLOGY, COLLECTED BY DR. J. W. HUDSON.

For the artistic collector, there is a very important mission, to know and to foster the aboriginal patterns and motives in decoration. Many of the shapes and designs in basketry are spurious. Besides the trashy imitations of letters and common things on basketry, which mislead no one, there is an unfortunate habit springing up of getting women of one tribe to imitate the designs of another tribe. This works confusion in two ways. It confounds the student of folk-lore absolutely, and, if there be any truth in the belief that in all art the material

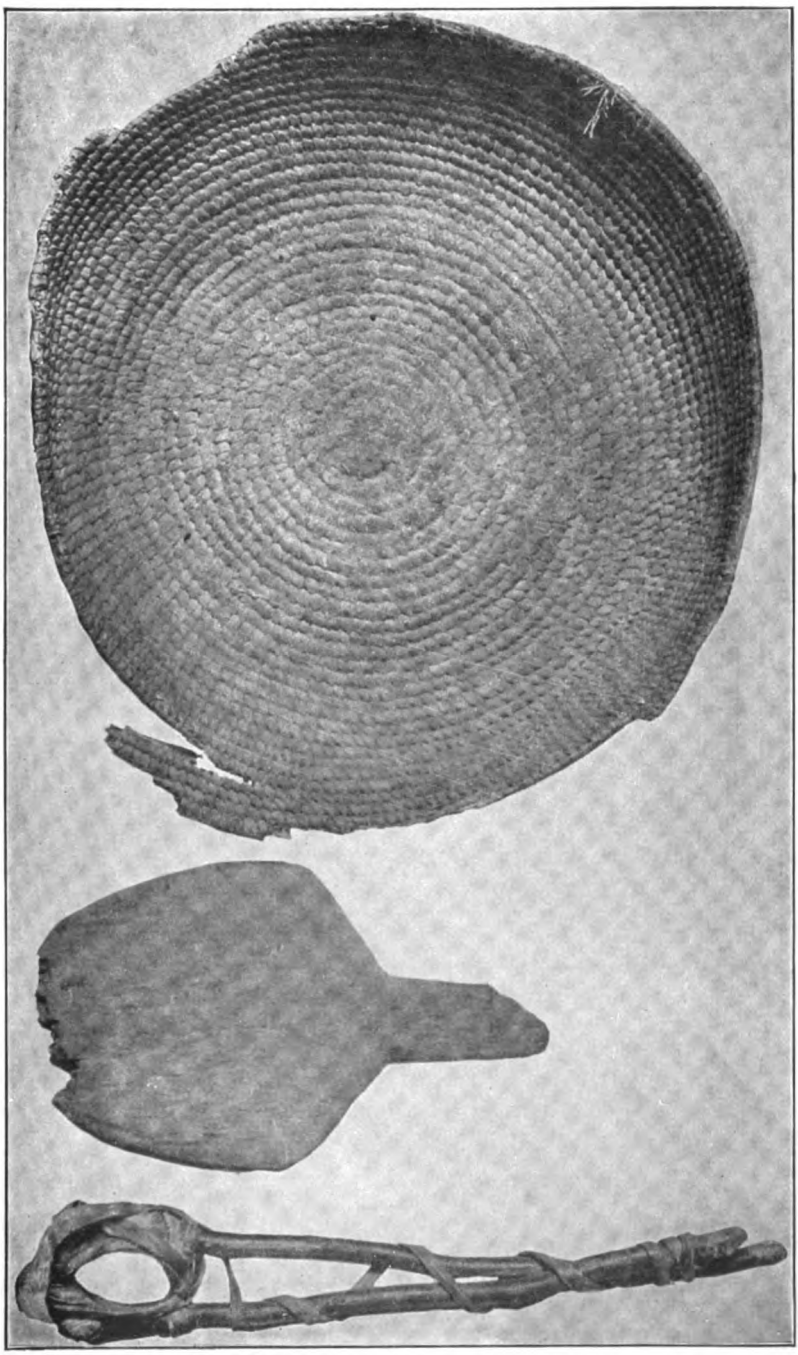


Plate 246. See page 499

ANCIENT COILED BASKET FROM COPPER MINE IN CHILE

Exhibited in Buffalo Exposition

and the motive have in the ages adapted themselves to each other "like perfect music unto perfect words," the attempt to put Apache ornaments on Pima or Wasco on Klikitat is discordant.

Preservation of Baskets

The art of a people must be judged by what they need not do and yet accomplish.—A. C. Haddon.

Textiles are among the most fragile and perishable of human industrial products. Insects and rust, heat and cold, too much and too little moisture, the common accidents of life, are hastening our pretty baskets to their dissolution. Therefore, how to prolong the life of a basket is a living question with all basket lovers, and the answer will be easier if the causes of destruction are known. The three enemies of baskets are moth and rust and human fingers. By the moth are meant all destructive animals; by rust, natural decay; and in the last agency must be classed the myriad ways by which our fellow-creatures purloin and destroy our treasures. E. S. Morse tells us that the Japanese do not make of their houses bazaars for the ostentatious display of art objects, but they put them away in silk bags, to bring forth when they wish to delight their friends. Those collections that have been made with a view to permanence should be kept so that they will suffer least from damage. The dust may be blown from the specimens with bellows. Those containing remnants of vegetable matter, berries, food, etc., should be carefully scrubbed with soap and water, and rubbed down with a very small portion of oil and dryer. Above all, they should be poisoned with a weak solution of corrosive sublimate or arsenic dissolved in alcohol. A card catalogue giving the legend and history of each piece would add much to the value of the collection.

A list of collections of rarities in American basketry is here appended, by no means complete, but it will aid the student

who wishes to prosecute his investigations further to find the material. First of all, in the great museums there are permanently in store priceless examples of basketry, and in addition many costly collections belonging to private individuals have thus rendered a great service to this writer. It is interesting to read over the names of the men and women who long ago contributed to the great museums precious examples of uncontaminated Indian art.

AMERICAN MUSEUM OF NATURAL HISTORY OF NEW YORK. The best assemblages of American basketry are the Emmons collection from Alaska; the Teit from the Chilcotin and the Thompson Indians (Jesup expedition); the Farrand from the Quinaielt (Jesup expedition); the Farrand from the Klikitat and Oregon (gift of Mr. Henry Villard); the Dixon from northern California (Huntingdon expedition); the Briggs collection from California (gift of Mr. George Foster Peabody); the Apache collection (gift of Mr. Andrew E. Douglass); the Pepper, of ceremonial baskets of the ancient cliff-dwellers (Hyde Expedition); baskets from the Chukchi Peninsula collected by Messrs. Jochelson and Bogoras (Jesup expedition). If we should include birch-bark baskets, one might also mention the Stone collection from Mackenzie Basin; and the Berthold Laufer collection from the Amur River (Jesup expedition). The basketry collection has been brought together for decoration, not for technic.

ANKENY, Mrs. LEVI, Walla Walla, Washington. Salish basketry.

BARRETT, S. A., Ukiah, California. All Pomo. About 150 pieces.

BENHAM, J. W., Phœnix, Arizona. Large and rich collection of Apache ollas, rare Pimas, and other basketry from the Southwest.

BENJAMIN, Mrs. CAROLYN G., Washington City. General collection. Good in Chetimachas.

BINGHAM, Mrs. J. E., 338 Katharine street, Walla Walla, Washington.

BISHOP, Mrs. THOMAS T., 2309 Washington Street, San Francisco, California. Miscellaneous.

BOGGS, Mrs. A. G., Redding, California. Principally Hat Creeks, of Shasta County, and Pit Rivers, of Modoc County. Some 200.

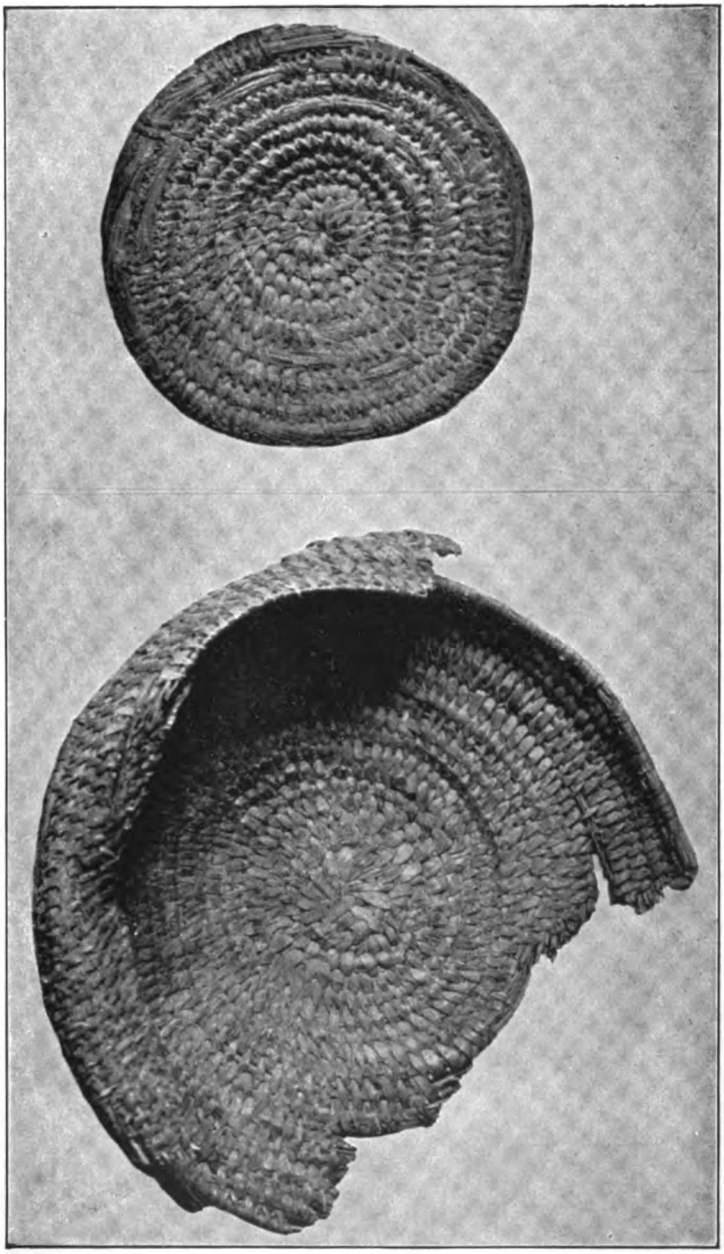


Plate 247. See page 499

ANCIENT COILED BASKETS FROM COPPER MINE IN CHILE

Exhibited in Buffalo Exposition

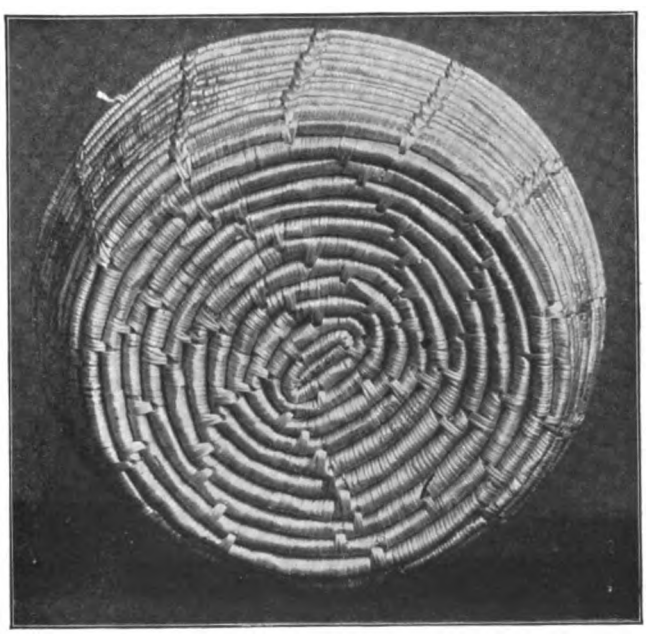


Plate 248. See page 500

MODERN COILED BASKET IN OPENWORK, PERU

Collections of U. S. National Museum

BRADFORD, Mrs. SIDNEY, Avery Island, Louisiana. Fine old Chetimachas.

BRIGGS, C. F., San Francisco, California. Miscellaneous. Very choice examples. Northwest coast, Pomos, Mariposan, and few fine Mission.

BRITTIN, L. H., Edgewater, New Jersey. Old Tlinkit baskets.

BRIZARD, BROUSSE, Arcata, California. Large Hupa material with illustrated catalogue.

BUCHANAN, CHARLES MILTON, Tulalip Agency, Tulalip, Washington. Good Salish collection.

BUGBEE, Mrs. SUMNER W., Pasadena, California, Miscellaneous.

BURDICK, J. W., Albany, New York. Rare Tulares.

BURGESS, JOHN D., Tucson, Arizona. Pima, Maricopa, and Apache examples.

CARPENTER, Mrs. HELEN M., Ukiah, California. Pomos.

CARROLL, ANDREW W., DE LA CŒUR, Ardglass, Ireland. Good California types.

CHICAGO UNIVERSITY. Especially Mexican. See Frederick Starr.

CINCINNATI MUSEUM OF FINE ART. General collection.

COHN, A., charming specimens of Washoe baskets, Nevada.

COLE, Mrs., Pasadena, California. General collection.

COOK, Mrs. J. B., Yosemite Valley, California. About seventy-five examples of Mono, Washoe, and Mariposan tribes.

COVERT, FRANK M., New York. Good in Arizona basketry.

COVILLE, FREDERICK V. Fine collection from the west coast to illustrate the plants used.

CROSS, Mrs. EDWARD, Salem, Oregon.

CURTIS, WILLIAM CONWAY, Norwalk, Connecticut. The Klikitat and other basketry of Washington.

DAGGETT, JOHN, Black Bear, Siskiyou County, California. Fine collection of Yurok and Karok material. Klamath and Salmon rivers, northern California. At present on deposit in the Memorial Museum, Golden Gate Park, San Francisco, California.

DAVENPORT ACADEMY MUSEUM, Iowa. Miscellaneous collection.

DEISHER, H. K., 50 Noble Street, Kutztown, Pennsylvania. Pomos and Wintuns, and a few good Maidus.

DESSEZ, Miss HENRIETTA LOUISE, Washington City. California and Interior Basin.

EATON, the Misses, Boston, Massachusetts. Very precious old California baskets.

EMMONS, G. T., Princeton, New Jersey. Excellent old Tlinkits.

ERICSON, A. W., Arcata, California. Photographs of basket-makers and baskets.

FEENEY, Miss KATHARINE, 1570 Filbert Street, Oakland, California. A fine miscellaneous collection.

FIELD COLUMBIAN MUSEUM OF CHICAGO has rich collections of basketry from all the north Pacific coast families, and especially old and beautiful specimens of Tlinkit twined ware, the gift of Mr. E. E. Ayer; from the Columbian Basin fifty Nez Percés twined wallets, many of them large and choice, and some of considerable age; sixty coiled and imbricated baskets of the Klikitats of various sizes. The last-mentioned two collections were made by Mr. E. E. Miller. From various parts of California, the Field Columbian possesses many choice baskets, and is especially rich in examples from tribes of the Kulanapan, Mariposan, and Moquelumnan families. These were gathered chiefly by Dr. J. W. Hudson, but many choice examples were the gift of Mr. E. E. Ayer. The same generous benefactor added to his gift large collections from the White Mountain and Mescalero Apaches; and from the Pimas, made by George A. Dorsey, Charles L. Owen, and S. C. Sims, typical series from special tribes. Dr. Dorsey's Ute collection should be mentioned, and also that from the Klamath tribe, numbering over 200 specimens and comprising all their forms, technical processes, and designs.

FROHMAN, Mrs. J., Portland, Oregon. West Coast basketry and matting.

GARDNER, Mrs. GEORGE S., Laurel, Mississippi. Tribes of Indian Territory, Georgia, and Louisiana. Also a fair series of Pacific coast work—Alaska, British Columbia, Washington, California, and Arizona.

GRAY, Mrs. WILLIAM, Salem, Oregon.

GREBLE, Mrs. MARY D., Pasadena, California. Rare old southern California pieces.

HALL, ROBERT C., Pittsburg, Pennsylvania. Miscellaneous. Good Pomos and Tulares.

HAMILTON, Miss HENRIETTA, Seattle, Washington. Large and choice collections from Alaska to California. Mostly in the Fred Harvey series.

HARBAUGH, Mrs. H. W., Colton, California. Choice California specimens.

HARVEY, FRED, Albuquerque, New Mexico. Large and rare collection from all the West coast region.

HEARST, MRS. PHEBE A., Berkeley, California. Miscellaneous. Very large collection. Rich in Pomos and central California tribes. The collection is in the University of California, and exhaustive studies are being made under her generous patronage.

HUBBY, Miss ELLA F., Pasadena, California. Excellent general Pacific coast collection.

HUDSON, MRS. GRACE, Ukiah, California. Fine Pomos. Dr. J. W. Hudson's two large collections from these tribes are in Washington and Chicago.

HYDE EXPLORING EXPEDITION, New York. Collection of basketry from the Southwest. Encourages the making of baskets and aids in the sale of them.

IDE, MRS. ESTHER C., Seymour Street, Syracuse, New York. Miscellaneous. Good Pomos and Tulares.

JACKSON, Col. JAMES, Salem, Oregon.

JAMES, GEORGE WHARTON, Pasadena, California. Especially good in examples from California Missions.

JOHNSTON, MRS. WILLIAM P., New Orleans, Louisiana. Chetimaches, Choctaws, and Attakapas.

JONES, PHILIP MILLS, State University, Berkeley, California.

KEPLER, JOSEPH, Inwood on the Hudson. General collection.

KIRKPATRICK, MRS. I. H., Adrian, Michigan. Fine Navahos.

LANDSBERG, FREDERICK, Victoria, British Columbia. General collection.

LANG, Miss ANNE M., The Dalles, Oregon. Collection of imbricated basketry. Large and rare.

LOOSLY, MRS. JOHN, 9 Pine Street, San Francisco, California. Miscellaneous.

LOWE, MRS. T. S. C., Pasadena, California. Fine, large collection. Rich in Pomos and central California tribes.

LYNCH, MRS. JAY, Fort Simcoe, Washington. General collection of west coast baskets.

MABLEY, Miss KATE, Detroit, Michigan.

MCARTHUR, MRS. H. K., 739 Glisan Street, Portland, Oregon. Collection from Washington and Oregon.

MACGREGOR, JOHN, Hope Station, British Columbia. Thompson River basketry.

MCKEE, Miss BELLE, Salem, Oregon.

McLEOD, E. L., Bakersfield, California. Large collection of baskets of Kern and Inyo tribes. A few Tulares.

McNEIL, Mrs. W. H., 1022 North Nineteenth Street, St. Joseph, Missouri. Miscellaneous.

MALLETT, J. H., Jr., San Francisco, California. A few fine Pomos and tribes in east-central California.

MASTERS, Mrs. W. U., Pasadena, California.

MASTIC, GEORGE H., Alameda, California. Large collection of Pomo baskets. A few good examples of Mariposan and Yokuts.

MERRIAM, C. HART, Washington City. About 1,000 examples of Western basketry, personally selected and card catalogued. A model collection.

MILLS, Mrs. ANSON G., Washington City. Select general collection.

MITCHELL, JOHN S., San Francisco, California. Miscellaneous. Good examples from Northwest coast and from Arizona.

MITCHELL, SUSMAN, Visalia, California. Excellent work of different tribes in Tulare and Kern counties, California.

MOLSON, Mrs. W. MARKLAND, Montreal, Canada. Washington and Oregon basketry.

MONTGOMERY, Mrs. J. B., Portland, Oregon.

MOSELEY, Mrs. WILLIAM H., New Haven, Connecticut. Collection on exhibition at the Peabody Museum of Yale.

NATIONAL MUSEUM.—The Museum is rich in collections of American basketry made to show all forms of technic and also to exhibit handiwork from tribes in the six areas. Beginning at the north, the collections of Ray from Point Barrow; of McFarlane and Ross at the Mackenzie mouth; the rich treasures gathered by Nelson in western Alaska; those of Dall, Turner, Appelgate, and Fisher farther south; and the Tlinkit ware selected by McLean, Swan, and Emmons amply illustrate the technical processes in that area.

Going southward, the Salish and other Fraser-Columbia basketry includes, among others, Wilkes, Swan, Eells, Shackelford, Emmons, and Willoughby collections.

The largest collections from California were made by Purcell, Ray, Stone, Powers, Hudson, Henshaw, Curtin in the north; by Holmes, Merriam, Rust, and Mead in the south.

The collections of basketry from the Interior Basin are the largest of all, being gathered by Palmer, Powell, Cushing,

Stevenson, Holmes, Fewkes, Hough, Mooney, and Russell, and officers connected with the numerous surveys. Much of this is very old. From farther south, from Middle and South America, the Museum is indebted to explorers and officers of various departments of the Government for typical material, the latest gathered on the Amazon by J. B. Steere.

NEWMAN, Mrs. H. W., San Carlos, Arizona. White Mountain Apache.

NICHOLSON, Miss GRACE, Pasadena, California. Choice old Californian specimens.

O'HARA, Miss, San Francisco, California. Good pieces of Old Missions.

OWEN, Mrs. WILLIAM, Sepacuite, Panos, Alta Vera Paz, Guatemala. Fine collection of Guatemala work.

PEABODY MUSEUM OF ARCHÆOLOGY AND ETHNOLOGY, Harvard University, Cambridge, Massachusetts. Collections which ought not to be neglected by the special student. Among these should be mentioned that of Mrs. George B. Linder, of Boston, rich in California material; that of Mrs. Mary Hemenway, devoted especially to the pueblo tribes of Arizona, the Hopi, being the collection made by Thomas Keam many years ago. Dr. Edward Palmer contributed to this series also material from southern California, especially from the caves. This series contains the outfit of a society, since the baskets were accompanied also by head dresses and musical instruments.

PICHER, Miss ANNIE B., Pasadena, California. General collection, well selected.

PLATT, Mrs. ORVILLE H., Meriden, Connecticut. General collection.

PLIMPTON, F. S., San Diego, California. Miscellaneous. Very choice. Fine Pomos. Good examples of work of different tribes throughout northern, central, and southern California.

POWER, Mrs. E. B., San Francisco, California. Choice Maidus.

PURDY, CARL W., Ukiah, California. Well-selected collection of Pomos.

ROBERTS, Mrs. ERNEST W., Chelsea, Massachusetts. General collection; fine old California.

ROSENBERG, Mrs. ANNA M., 1605 East Madison Street, Seattle, Washington. Some fine Pomos. Few good examples of Tulare and Kern tribes.

ROST, Mrs. H., Portland, Oregon.

RUMSEY, C. E., 110 Indiana Avenue, Riverside, California. Excellent collection from the Southwest; selected for instruction.

RUSSELL, Mrs. GEORGE F., Portland, Oregon.

RUST, HORATIO N., Pasadena, California. Good, in work of the Missions.

SEQUOYA LEAGUE, The. A corporation whose design is "to make better Indians." One of its objects is to revive, encourage, and provide market for such aboriginal industries as can be made profitable.

SHACKELFORD, Mrs. R. S., The Dalles, Oregon. Excellent Klikitats and Wascos.

SHARPE, Miss ELIZABETH M., Wilkesbarre, Pennsylvania. General collection.

SMITH, Mrs. EMILY A., 2226 Jackson Street, San Francisco, California. Miscellaneous. A number of exceptionally fine Pomos, including several solidly feathered. Also some choice examples from Tulare, Kern, and Inyo counties, the Missions, Alaska and British Columbia, etc.

SPIEGELBERG, A. F., Santa Fe, New Mexico. Large collection of basketry from southwestern United States.

STANFORD, Mrs. JANE L. (Mrs. Leland). In her museum at Palo Alto is a good collection of Tulare baskets. Also fair representation of the Klamath River material. The latter collected by John Daggett.

STARR, FREDERICK, University of Chicago, Chicago, Illinois. Collection of basketry from southern Mexico.

STEVENS, Mrs. FREDERICK H., Buffalo, New York.

STONE, Mrs. B. W., San Francisco, California. Miscellaneous collection. Very good specimens from various tribes of central California.

TAPLEY, Mrs. LOUIS, Salem, Oregon.

TEIT, JAMES, Spences Bridge, British Columbia. Good in Thompson River. Largely in American Museum of Natural History, New York.

TEVIS, Mrs. WILLIAM, Bakersfield, California. Large collection of baskets of Kern, Inyo, and Tulare tribes. A number of very fine and rare pieces. Many old examples.

TOZIER, D. F. A very large and choice collection from southeastern Alaska, British Columbia, and Washington. On exhibition in Tacoma, Washington.

TUTTLE, E. O., 28 State Street, Boston, Massachusetts. Miscellaneous. Some good Pomos and Tulares.

UNIVERSITY OF CALIFORNIA is conducting an exhaustive survey of the State, both in archæology and ethnology, under the patronage of Mrs. Phebe A. Hearst.

UNIVERSITY OF PENNSYLVANIA has a large series of basketry, sandals, and other textile material from the cliff-dwellers of Mancos Canyon, given by Mrs. Phebe A. Hearst.

VROMAN, A. C., Pasadena, California. Fine old Pima and Apache baskets.

WADLEIGH, W. J., Hope Station, British Columbia. Klikitats.

WANAMAKER, JOHN, Philadelphia, Pennsylvania. Miscellaneous.

WHITMORE, Mrs. W. L., Salem, Oregon.

WILCOMB, C. P., Memorial Museum, Golden Gate Park, San Francisco, California. Large and choice collection of California basketry, well identified and labelled.

WILLIAMS, H. E., Cassel, California. Fine collection of Hat Creek baskets.

CHAPTER IX

BIBLIOGRAPHY

And let her works praise her in the gates.—KING LEMUEL

THE following list of publications will help to follow up this study in special lines. A great awakening of interest in the processes of savage industries as the foundation of all modern machine work has stimulated the production of excellent books and papers on basketry. At the moment of going to press, the author of this general treatise learns of several. Doctor P. E. Goddard, of the University of California, was so good as to lend his proof on the Hupas; Frank Russell on the Pimas had not appeared; Emmons on the Tlinkit, and Dixon and Kroeber's further studies on California basketry, were not in print.

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